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Paper Groups Preparing for Industrial Control

S. L. Willson, Recently Appointed Chief Representative of Paper, Pulp and Allied Industries, to Contact With Government Agencies and to Head the Organization of the Industry for Action Under Recovery Act, Confers With Assistant to Administrator—Paper Man Will Be Part of Administrator's Organization

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 14, 1933.—S. L. Willson, president, and Charles W. Boyce, executive secretary of the American Paper and Pulp Association, were here last week conferring with W. L. Allen, assistant to General Hugh S. Johnson, who will be the Administrator under the Industrial Recovery Law.

They told Mr. Allen of what the paper industry is doing under the new law and what it intends to do and he in turn gave them suggestions for further development of the work which they are not at liberty to discuss at this time.

It is understood that a paper man will be a part of General Johnson's organization, although who it will be has not yet been determined.

Central Agency Formed

At a meeting of the various group organizations of the paper industry called by the American Paper and Pulp Association on June 2, it was unanimously decided that the American Paper and Pulp Association should be reorganized to act as the central agency for the formulation and administration of the industry's code under the National Industrial Recovery Act.

A resolution was unanimously adopted electing S. L. Willson, president of the association, as the chief representative of the paper, pulp and allied industries to contact with Governmental agencies and to head the organization of the industry for action under the Recovery Act. Mr. Willson has addressed the United States manufacturers of paper and pulp, as follows:

"The National Industrial Recovery Act, now pending in the Congress, constitutes a vast regimentation of industry for the purpose of rebuilding the social and business security of the United States. The primary object of the bill is to extend employment and to increase wages. It is believed, however, that it is intended also to afford opportunities whereby industry, through self-regulation, can eliminate trade and production practices that have contributed to the demoralization of the past three years. In a very literal sense, this act enlists American industry in a war on depression.

"General Hugh S. Johnson, who is indicated to be the definite selection of the President to administer the Act, has requested that the paper industry be prepared to act as soon as the bill is passed. He has expressly stated that he wishes to deal with the paper industry as a whole, and he has urged that the industry prepare a single program with which all units are in harmony.

"The American Paper and Pulp Association called a meeting of representatives of the group organizations on June 2nd to plan the organization of the industry for these purposes. At that time the final provisions of the National Industrial Recovery Act had not been determined, nor had the administrative regulations been formulated. That situation still exists. Obviously, provisions of a code could be discussed only in broad terms. Furthermore, it was thought unwise to commit the industry even in a tentative way to a definite code until the Government's requirements were thoroughly established and known.

"However, the need of early cooperation with the Government was held as highly desirable. Under the circumstances, the logical preparatory step was to concentrate authority in the groups and to establish a further focusing of authority of the groups in a single individual, if that proves necessary, or in a small committee, that will represent the industry, so that the industry can act with dispatch and with properly representative regard to the special conditions of the groups as soon as called upon after the enactment of the legislation.

"At this meeting it was unanimously decided that the American Paper and Pulp Association should be reorganized to act as the central agency for the formulation and administration of the industry's code, functioning in both respects through the group organizations in so far as possible.

"A resolution was unanimously adopted electing me as the chief representative of the paper, pulp and allied industries to contact with Governmental agencies and to head the organization of the industry for action under the Recovery Act. Another resolution was recommended for submission to the group associations whereby necessary authority could be established for reorganization of the Association and for the concentration of authority in group leaders, thus providing for rapid delegation of authority from the Government at the top to the homogeneous groups in the industry, whereby self-regulation,

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Superintendents Meet at Green Bay, Wis.

Fourteenth Annual Convention of the American Pulp and Paper Mill Superintendents Association Is Largely Attended and Is An Outstanding Success In Every Respect—Herbert T. Randall Is Elected To Head the Organization for the Ensuing Year

[FROM OUR SPECIAL CORRESPONDENT]

GREEN BAY, Wis., June 12, 1933.—The Fourteenth Annual Convention of the American Pulp and Paper Mills Superintendents Association, which met here on Thursday, Friday and Saturday of last week, was one of the most successful and largely attended meetings ever held by the organization. The motto of the convention was "Progress Will Bring Prosperity" and this was exemplified in many ways. The convention committee under the leadership of F. J. Timmerman did an unusually good job and with the cooperation of the Chamber of Commerce and the hotel management, nothing was left undone to make the visiting superintendents feel thoroughly at home. The papers read at this meeting were very instructive and covered all divisions of the pulp and paper making industry.

Peddlers' Frolic on Wednesday

Although the convention proper did not start until Thursday morning, Wednesday was the day for the Peddler's Frolic and a very enjoyable day was spent at the Oneida Golf Club playing golf, shooting clay pigeons, and other forms of sport—a dinner being held at the Beaumont Hotel in the evening after which initiation into the China Paper Makers was had. Thursday morning the meeting was called to order by Chairman Frank J. Timmerman and the invocation was given by Right Reverend Paul T. Rhode, D.D., Bishop of the Green Bay Diocese. John B. Diener, Mayor of Green Bay, welcomed the superintendents and visitors and gave them the freedom of the city. The response was given by Herbert T. Randall who then introduced President W. H. Brydges, who gave the opening address which reviewed some of the strenuous time of the past year but looked forward to the future with greatest hope and encouragement, and urged all to work together for the improvement and betterment of industry.

The papers presented at the morning session were "Lubrication of Ball, Roller Bearings and Reduction Gears," by John Stack, Standard Oil Company of Indiana, and "Developments in the Paper Industry," by Allen Hyer, Black Clawson Company, Hamilton, Ohio, who erected in front of the members on miniature scale a complete cylinder machine, showing the cylinder moulds, stacks of driers, calendar stacks, winders, etc., giving a very clear idea of how a machine would look when erected in a paper mill. Following this was a paper on "New and Future Uses for Paper," by E. T. A. Coughlin, Pettingell, Inc., Chicago. At the joint luncheon Frank P. Bond of the Bay West Paper Company was the toastmaster, and Edward F. Flynn of the Great Northern Railway, was the speaker. In the afternoon session the following papers were read: "The Properties of Paper Pigmented with Zinc Sulphide," Howard M. Cyr, New Jersey Zinc Company; "White Water Problems," C. M. Baker, Madison, Wis.; "Anticipating Maintenance Expense by Proper Inspection," E. E. Berry of Beloit Iron Works, Beloit, Wis.; "The Control of Man Failure," Chester P. Waite, Travelers Insurance Company; "Constant Tension Regulator on Reels and Unwinding Stand," R. H. Smith, Reliance Electric and Engineering Company; "Windowless Paper Mill," A. E. Montgomery; and "Benefits of Chromium to the Paper Industry," A. F. Francis, Chromium Corporation of America.

Group Meetings

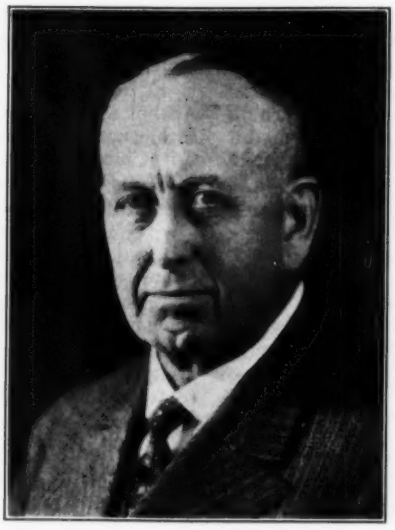
The group dinner was held at the Hotel Beaumont, with C. E. Jackson of the Consolidated Water Car and Paper Company as toastmaster. J. G. Rosebush, general manager of the Northern Paper Mills delivered a very inspiring talk on "Initiative," after which the men broke up into group meetings as follows:—Book and Fine Paper, Chas. Champion, chairman. The following papers were read: "Fourdrinier Shakes and Formation," Herbert T.

HERBERT T. RANDALL
President

KILLEY E. TERRY
First Vice-President

CHARLES CHAMPION
Second Vice-President

F. J. TIMMERMAN
Fourth Vice-President



MICHAEL REDMOND
Third Vice-President

GEORGE M. TROSTEL
Fifth Vice-President

Randall, The Champion Coated Paper Company; "Improving the Quality and Increasing the Uses of Paper with Rosin Wax," Charles W. Outterson, Bennett, Inc. Tissue Group. H. H. Harrison, chairman, had the following papers: "Round Table Question Box and Discussion of the Tissue Machines Around Green Bay"; "Paper Machine Variables," W. A. Chilson, Forest Products Laboratory. Board and Coarse Paper Group, R. H. Kelly, chairman. "Hazards of the Machine Room," was presented by Arthur Murray, Insurance Department, Container Corporation of America. A discussion of the various new and late improvements and devices used on cylinder machines was followed by a Question Box. An unusual and novel discussion of the new cylinder machine recently built. This is an exclusive feature and has never been presented before any group by any manufacturer of pulp and paper machinery.

Ground Wood Pulp Group, R. H. Haddock, chairman had the following papers: "Some Observations on Ground Wood Pulp Manufacturing," E. R. Durand, Blandin Paper Company. Also paper by Leo Doty, Escanaba, Mich.

Soda Sulphate Group, George M. Trostel, chairman, had the following papers: "The Influence of Sulphidity on the Physical and Chemical Characteristics of Kraft Pulp," G. H. McGregor and Otto Kress, Institute of Paper Chemistry. "The Operation of the Cottrell Precipitator," B. D. Milledge, manager, Howard Smith Paper Mills, Ltd. Discussion of Waste Heat Recovery, C. L. Durkee, D. J. Murray Manufacturing Company. "The Influence of Chemical Concentration in the Alkali Pulping Process," Dr. C. E. Curran, Director, Forest Products Laboratory, and M. W. Bray.

Sulphite Pulp Group, M. W. Hedden, chairman, had the following papers "Relation of Yield and Quality of Sulphite Pulps to the Wood Species Employed," Dr. C. E. Curran, Forest Products Laboratory. "Improving the Quality and Processes of Manufacture of Bleached Sulphite Pulp," John D. Rue, and James S. Sconce, Hooker Electrochemical Company. "General Discussion of the More Recent Modications in Sulphite Cooking Methods" led by S. E. Tomczak, Flambeau Paper Company.

Papers Presented Friday

At the Friday morning session these papers were presented: "Educational Film on Carborundum," F. D. Bowman, Carborundum Company. "The Introduction of Elemental Chlorine in the Bleaching of Pulp," J. E. Underwood, and C. F. Weitzel, Pennsylvania Salt Manufacturing Company. "Two-Stage Bleaching in Bellmers," John Hansen, Badger Paper Mills, Inc. After these papers adjournment was held for luncheon. The toastmaster was A. D. Murphy, Association of Commerce and the speaker was J. M. Conway, General Manager of the Hoberg Paper and Fibre Company, who delivered a very inspiring talk on "Your Duties and Mine."

After luncheon a continuation of discussion was held together with a business meeting and election of officers. The following officers were elected: President, Herbert T. Randall, The Champion Coated Paper Company; First Vice President, Killey E. Terry, S. D. Warren Company; Second Vice President, Charles Champion, Millers Falls Paper Company; Third Vice President, Michael Redmond, Kalamazoo Paper Company; Fourth Vice President, Frank J. Timmerman, Northern Paper Mills, and Fifth Vice President, George M. Trostel, Champion Fibre Company, and Robert M. Emminger, Miamisburg, Ohio, secretary. The meeting then adjourned until the Annual Banquet held in the Crystal Ball Room of the Northland Hotel.

W. H. Brydges Presented With Watch

Will L. Evans officiated as toastmaster, who introduced the speaker James E. Gheen, who in a humorous way pointed out some of the things that would put us on the road to recovery. The past president jewel was presented to W. H. Brydges by Past President E. T. A. Coughlin. The Eastwood Golf Cup was awarded to Herbert Randall. The Annual Trophy donated each year by L. D. Post to the member whose contributions to the Association have been of an outstanding character was awarded to W. H. Brydges, after which Miss Lucille Neusel, soprano, Royal Opera, Leige, Belgium, entertained with several selections. Dancing to music furnished by L. R. Smith orchestra was enjoyed for the balance of the evening.

Saturday morning visits to the Green Bay Mills and to the Institute of Paper Chemistry of Appleton closed one of the finest of conventions and too much credit cannot be given to the committee who handled it.

Ladies Royally Entertained

The ladies were entertained in a royal manner by the

Ladies Entertainment Committee under the able leadership of Mrs. A. E. Cofrin, chairman. Wednesday they had luncheon at the Beaumont Hotel followed by a dinner at Alaska Lake. Thursday morning they were taken to the historical places in and around Green Bay, returning in time to join the men in a luncheon at the Northland Hotel, after which there followed a bridge party with a lecture and instructions in contract given by Mrs. A. E. Winters and Mrs. W. J. McCormick. The score cards were furnished by J. W. Raines of the Dindsay Wire Weaving Company, Cleveland, Ohio, one of the four aces. This was followed by a banquet at the Y. M. C. A. and a theatre party. Thursday they were taken to the cherry orchards and state park in Door County stopping for luncheon at Maxwellton Braes, Bailey's Harbor, returning in the evening to join the men in the banquet and dancing.

The Exhibition

Following are the exhibitors at the Convention: American Rolling Mills, who had a display of spiral pipes in hot dipped galvanized mill coated hot dipped asphalt coated together with photographs showing their application; Arabol Manufacturing Company, a complete line of glues and adhesives and showing their uses; The Century Electric Company, a display of their splash proof motors; Bailey Motor Company, one of their recording meters, also showing their different meter recorders; Chromium Corporation of America, showing their line of chromium equipment for the paper and pulp mills; Cameron Machine Company, makers of high grade slitters for all classes of work; Crane Company, a display of valves for paper and pulp mill work; Roots-Connersville-Wilbraham, showing their new vacuum pump for paper and pulp mills; Dodge Manufacturing Company, with their line of Timken Dodge bearings and other transmission equipment; De Laval Steam Turbine Company, with turbine pumps and other power equipment; Falk Gear Company, showing their new four-duty coupling together with speed reducers; Fafnir Bearing Company, with a line of their roller and antifriction bearings; Hudson Sharp Machine Company, who showed their latest embossing and napkin folding machine; Michigan Steel Casting Company, showing the line of Misco Compression fittings, valves and strainers; with them was the Neenah Brass Works showing the Horkman blowout valve with a removable alloy seat; Globe Stainless Steel Tube Company, steel tubes; Nelson Machine Company, showing the Century Motor, and Republic Rubber Company products for paper mills; Reeves Pulley Company showing their line of variable speed transmissions for paper and pulp mills; H. H. Robertson Company with a line of ventilators and an improved skylight for paper mills; Ameil Umberham, the line of safety appliances for the workmen in a paper mill; Wallace & Tiernan Company with a line of controlled apparatus for paper and pulp mills; Paper Converting Machine Company with their line of napkin, towel, and toilet machinery, and Louis Allis Company, a practical demonstration of their splash proof motor.

Those Who Attended

The official registration was as follows:

A. W. Agrell, Patten Paper Co., Kaukauna, Wis.; O. P. Arnold, Stowe Woodward Co., Newton Upper Falls, Mass.; Ross Anvil, Crystal Tissue Co., Middletown, Ohio; N. P. Ardwell, Carthage Machine Co., Carthage, N. Y.; A. J. Allison, Simonds Worden, White Co., Dayton, Ohio; C. H. Altenhof, American Sheet & Tin Plate Co., Chicago, Ill.; Sam I. Anderson, Hooker Electrochemical Co.; L. B. Armstrong, Hewitt Gutta Percha Rubber Co., Milwaukee, Wis.;

C. L. Bachelder, Paper Makers Chemical Corp., Kalamazoo, Mich.; Harold R. Bailey, Union Screen Plate Co., Fitchbury, Mass.; E. N. Bechard, Eastwood Nealley Corp., Belleville, N. J.; Bernard Benson, Williams Gray Co., Chicago; Henry Bent, Shuler & Benninghofen, Monroe, Mich.; E. E. Berry, Beloit Iron Works, Beloit, Wis.; R. P. Bieler, Arabol Mfg. Co., Chicago, Ill.; O. T. Birkeness, Wallace & Tiernan Co., Chicago, Ill.; C. C. Bleil, E. I. DuPont & Co., Chicago; Bernard Barnstein, Norton Co., Worcester, Mass.; R. C. Bomens, Minneapolis Honeywell Regulator Co., Milwaukee, Wis.; Francis D. Bowman, Carborundum Co.; Niagara Falls, N. Y.; F. C. Boyce, Wausau Paper, Wausau, Wis.; A. T. Brainard, Ciba Co., Chicago; L. H. Breyfogle, Draper Bros. Co., Kalamazoo, Mich.; Richard and Betty Brydges, Children of Pres. Brydges; W. E. Buchanan, Appleton Wire Works, Appleton, Wis.; W. H. Burns, Valley Iron Works, Appleton, Wis.; Geo. Burridge, Hoberg Paper & Fibre Co., Green Bay, Wis.; C. H. Burrows, Mohawk Valley Paper Co., Little Falls, N. Y.; H. H. Burrows, Manhattan Rubber Mfg. Co., Passaic, N. J.; C. M. Baker, American Paper & Pulp Association, Madison, Wis.; J. B. Beck, E. B. Eddy Co., Ltd., Hull, Que.; B. T. McBain, Portland, Ore.; H. D. Banta, Hoberg Paper & Fibre Co., Green Bay, Wis.; E. R. Bartlett, Hooker Electrochemical Co., Niagara Falls, N. Y.; H. J. Bartless, Crane Co., Chicago; B. Beasley, Brown Paper Mill Co., Monroe, La.; Myron T. Bennett, New Jersey Zinc Co., Chicago; Thos. Nelson Bishop, Pittsburgh Piping & Equip. Co., Chicago; Geo. A. Bogle, Central Fibre Products Co., Tama, Iowa; L. M. Booth, Booth Chemical Co., Elizabeth, N. J.; Peter Borenz, Marathon Paper Mills Co., Menasha, Wis.; Dr. J. W. Born, Marinette & Menominee Paper Co., Marinette, Wis.; A. W. Bouffard, Green Bay Vocational School, Green Bay, Wis.

P. D. Bradley, Fort Howard Paper Co., Green Bay, Wis.; Mark W. Bray, Forest Products Laboratory, Madison, Wis.; G. S. Brazeau, Weyerhauser Timber Co., Chicago; Adam Bridge, Shartle Bros. Machine Co., Middletown, Ohio; H. E. Brown, New Jersey Zinc Co., Chicago; J. J. Brunette, Foxboro Co., Chicago; Wm. H. Brydges, Bedford Pulp & Paper Co., Big Island, Va.; James Brydges, Pres. Brydges' Son; Ralph Burrows, Burrows Paper Corp., Little Falls, N. Y.; F. H. Burrows, Burrows Paper Corp., Little Falls, N. Y.; A. A. Burrows, Burrows Paper Co., Little Falls, N. Y.; Frank L. Barston, United States Rubber Co., New York.

Fred Cherrie, Castle & Overton, Inc., Chicago; James Clark, National Aniline Co., Chicago; Wm. B. Clements, Bryant Paper Co., Kalamazoo, Mich.; Art A. Coffin, Titanium Pigment Co., Inc., New York City; John E. Costello, J. M. Huber, Inc., New York, N. Y.; H. C. Gouch, Morgan Paper Co., Lititz, Pa.; Edw. T. Coughlin, Pettengell, Inc., Chicago; W. A. Crawford, Dominion Box Boards, Ltd., Toronto, Ont.; L. L. Cunningham, Minneapolis Honeywell Co., Minneapolis, Minn.; Manley Callender, DuPont Cellophane Co., Minneapolis, Minn.; O. W. Callighan, Edgar Bros. Co., New York City; Geo. L. Cavaness, Geo. L. Cavaness, Appleton, Wis.; G. H. Chidester, Forest Products Laboratory, Madison, Wis.; F. R. Colton, Standard Oil Co., Minneapolis, Minn.; John E. Carruthers, Interlake Tissue Mills, St. Catherine, Ont.; G. L. Chamberlin, Asten-Hill Mfg. Co., Philadelphia, Pa.; Chas. Champion, Millers Falls Paper Co., Millers Falls, Mass.; W. A. Chilson, Forest Products Laboratory, Madison, Wis.; Andrews Christensen, Rhinelander Paper Co., Rhinelander, Wis.; C. J. Christensen, Fibre Making Processes, Chicago; W. N. Claflin, H. G. Goodman Co., Columbus, Ohio; C. L. Clarke, Nash Engineering Co., New York, N. Y.; Edward J. Clarke, Central Fibre Products Co., Quincy, Ill.; W. E. Clark, Standard Oil Co., Green Bay, Wis.; A. W. Cole, Rex Paper Co., Kalamazoo, Mich.; G. E. Corson, Clinton Corn Syrup Ref. Co., Clinton, Iowa; W. T. Costello,

Joseph E. Loughead Co., Kalamazoo, Mich.; Geo. F. Cropsey, Research Corp., Chicago, Ill.; Dr. C. E. Curran, Forest Products Laboratory, Madison, Wis.; Howard M. Cyr, New Jersey Ink Co., Palmerton, Pa.; P. L. Conway, Link Belt Co., Chicago.

John A. Daley, Port Huron Sulphite & Paper Co., Port Huron, Mich.; Wm. D. Dalrymple, U. S. Rubber Co., Milwaukee, Wis.; Chas. Davidson, Jr., Southworth Paper Co., W. Springfield, Mass.; D. B. Davies, Rainier Pulp & Paper Co., Shelton, Wash.; Edward E. Don Dooven, Hoberg Paper & Fibre Co., Green Bay, Wis.; L. M. Doty, Escanaba Paper Co., Escanaba, Mich.; E. R. Durand, Blandin Paper Co., Grand Rapids, Mich.; L. Gilber Durant, E. B. Eddy Co., Ltd., Hull, Que.; H. S. Diehl, Acme Steel Co., Chicago; Al. De Olloqui, H. Waterbury & Sons Co., Oriskany, N. Y.; J. H. Dow, Castle & Overton, New York; Lewis Dozier, Rhinelander Paper Co., Rhinelander, Wis.; T. W. Dunn, Dunn Sulphite & Paper Co., Port Huron, Mich.; C. L. Durkee, D. J. Murray Mfg. Co., Wausau, Wis.; F. W. Driscoll, Economy Laboratories Co., Kalamazoo, Mich.

K. W. Erickson, Titanium Pigment Co., Inc., St. Louis, Mo.; W. L. Evans, Evans & Merrill, Green Bay, Wis.; L. H. Everlien, Appleton Woolen Mills, Appleton, Wis.; Frank B. Eilers, Kalamazoo, Mich.; Robert Eminger, American Pulp & Paper Mill Superintendents Association, Miamisburg, Ohio.

W. A. Fannon, Fannon Trading Co., Appleton, Wis.; W. W. Fitzgerald, Northern Paper Mills, Green Bay; Wm. P. Feeney, Mosinee Paper Co., Mosinee, Wis.; L. P. Fortier, Michigan Paper Co., Plainwell, Mich.; Harry D. Frost, W. S. Tyler Co., Cleveland, Ohio; W. L. Frey, B. F. Goodrich Rubber Co., Chicago, Ill.; Paul Freedley, Pennsylvania Salt Mfg. Co., Philadelphia; James Foxgrover, Paper Makers Chemical Co., Kalamazoo, Mich.; A. F. Francis, Chromium Corp. of America, Milwaukee, Wis.; A. E. Fuller, Gilman Paper Co., Gilman, Vt.; W. W. French, Dodge Mfg. Co., Mishawaka, Ind.

J. E. Gheen, New York, N. Y.; Tom Gillespie, Pennsylvania Salt Mfg. Co., Chicago; W. A. Cooke, Shartle Bros., Middletown, Ohio; L. T. Gorrie, S. D. Warren Co., Cumberland, Maine; Buster L. L. Griffiths, Jr., Heller & Merz Corp., New York; J. W. Grimes, Standard Oil Co., Chicago, Ill.; A. T. Gardner, Combined Locks Paper Co., Appleton, Wis.; A. E. Garrison, Cornell Wood Prod. Co., Cornell, Wis.; E. C. Gildenzopf, Schmidt & Ault Paper Co., York, Pa.; E. P. Gleason, Nekoosa Edwards Paper Co., Port Edwards, Wis.; H. W. Gochnauer, Northern Paper Mills, Green Bay, Wis.; F. E. Greenwood, Munising Paper Co., Munising, Mich.; W. E. Griffiths, Illinois Steel Co., Chicago, Ill.; W. H. Guidotti, Leavens Guidotti Co., Neenah, Wis.; W. L. Gilman, Brown Co., Portland, Me.

A. B. Hansen, M. & M. Paper Co., Marinette, Wis.; J. D. Haskell, Dilts Machine, Fulton, N. Y.; M. H. Haskins, Hoberg Paper & Fibre Co., Green Bay, Wis.; R. W. Haddoch, Escanaba Paper Co., Escanaba, Mich.; W. B. Hadley, Kellogg Paper Products Co., Chicago, Ill.; S. E. Halmer, U. S. Rubber Co., Minneapolic, Minn.; J. A. Mamm, Shartle Bros. Machine Co., Middletown, Ohio; John Hansen, Badger Paper Mills, Peshtigo, Wis.; H. H. Harrison, Crystal Tissue Co., Middletown, Ohio; Otto Hartman, Wolf River Paper & Fibre Co., Shawano, Wis.; F. J. Hoor, Stebbins Engineering & Manufacturing Co., Watertown, N. Y.; F. J. Hofherr, M. & M. Paper Co., Marinette, Wis.; Harold Holden, Paper Makers Chem. Corp., Stoneham, Mass.; J. M. Holderby, State Board of Health, Madison, Wis.; H. A. Horan, Penick & Ford Sales Co., Cedar Rapids, Iowa; Geo. W. Hartdaker, Sinclair Co., Holyoke, Mass.; Jack Hewitt, Hewitt Machine Co., Neenah, Wis.; Walter S. Hodges, Appleton Wire Works, Portland, Ore.; R. W. Holden, Stowe Woodward, Inc., Newton Upper Falls, Mass.; Roger Wolcott Hooker, Hooker Electrochemical Co., New York City; A. J. Hutchenson, Standard Oil Co., Green Bay, Wis.; Allen Hyer, Black Clawson So., Hamilton, Ohio.

W. E. Ihling, Sinclair Co., Holyoke, Mass.

J. H. Jackson, W. S. Tyler Co., Chicago, Ill.; Peter E. Jones, Patten Paper Co., Kaukauna, Wis.; E. C. (Bud) Jacobi, Standard Oil Co., Green Bay, Wis.; Harry Jacqmen, Fort Howard Paper Co., Green Bay, Wis.; C. K. R. Johnson, Downingtown Mfg. Co., Downingtown, Pa.; H. D. Johnson, Link Belt Co., Chicago.

L. H. Kelly, Marathon Paper Mills Co., Rothchild, Wis.; A. J. Kennedy, Sandy Hill Iron & Brass Works, Hudson Falls, N. Y.; R. V. Knapp, Bailey Meter Co., Milwaukee, Wis.; F. H. Knowlton, Staley Sales Corp., Decauter, Ill.; W. H. Kraske, Anglo Newfoundland Development Co., Grand Falls, Newfoundland; Jacob Kuss, Michigan Paper Co., Kalamazoo, Mich.; R. D. Kehoe, Sturdevant Mill Co., New York City; Norman Kelley, Weyerhauser Timber Co., Longview, Wash.; W. A. Kelley, Reliance Elec. & Eng. Co., Milwaukee, Wis.; W. A. Kelly, Portland, Ore.; Robert Kennedy, Rhinelander Paper Co., Rhinelander, Wis.; M. J. Ketter, Hoberg Paper & Fibre Co., Green Bay, Wis.; Kenneth T. King, Du Pont Co., Chicago, Ill.; A. D. Kirk, Standard Oil Co., La Crosse, Wis.; F. P. Knack, F. C. Huyck & Sons, Albany, N. Y.; Fred Kranhold, Kimberly Clark Corp., Appleton, Wis.; Dr. Otto Kress, Institute of Paper Chemistry, Appleton, Wis.; I. E. Kolm, National Aniline & Chemical Co., New York.

Oliver F. Lane, Krebs Pigment & Color Corp., Newark, N. J.; H. T. Latham, E. I. Du Pont de Nemours Co., Chicago, Ill.; O. L. Le Roux, Hennipen Paper Co., Little Falls, Minn.; E. A. Lindberg, Northern Paper Mills, Green Bay, Wis.; J. H. Loomis, Heller & Merz, Inc., Chicago, Ill.; N. J. Landface, Appleton Wire Works, Holyoke, Mass.; Fritz Lueder, Seybold Mach. Co., Dayton, Ohio; A. J. Leighton, Babcock & Wilcox Co., Chicago; K. E. Lenny, S. D. Warren, Cumberland, Me.; E. F. Lenz, Hoberg Paper & Fibre Co., Green Bay, Wis.; W. F. Luking, The Waterbury Felt Co., Skaneateles Falls, N. Y.; A. G. Lyeth, Babcock-Wilcox Co., Barberton, Ohio.

M. F. McCombs, Electro Bleaching Gas Co., New York, N. Y.; E. R. McCormack, Central Wire Cloth Co., Green Bay, Wis.; R. G. MacDonald, Technical Association, New York, N. Y.; John F. McKenzie, Don Valley Paper Co., Toronto, Ont.; C. J. McMahon, Wm. E. Hooper & Sons, Philadelphia, Pa.; C. I. McNair, Jr., Northwest Paper Co., Cloquet, Minn.; Milton McGuire, Paper Makers Chemical Co., Albany, N. Y.; H. A. Morrison, Oliver United Filters, Inc., Chicago; W. Macklem, Black Clawson Co., Hamilton, Ohio; A. K. McNaughton, Northern Paper Mills, Green Bay, Wis; Geo. J. Maye, Appleton Wire Works, Appleton, Wis.; I. R. McCall, Michigan Steel Casting Co., Milwaukee, Wis.; E. McWhirter, Provincial Paper Co., Georgetown, Canada; B. H. Metternick, Marathon Paper Mills Co., Ashland, Wis.; John Meyer, Badger Paper Mill, Peshtigo, Wis.; J. F. Moes, Rhinelander Paper Co., Rhinelander, Wis.; A. J. Monro, Buffalo, N. Y.; E. A. Morse, Fannon Trading Co., Appleton, Wis.; M. V. Mosberry, General Electric Co., Milwaukee, Wis.; A. D. Murphy, Association of Commerce, Green Bay, Wis.; Frank S. Murphy, Lockport Felt Co., Appleton, Wis.; C. J. McMahon, W. M. E. Hooper & Sons, Philadelphia, Pa.; L. J. McNamara, Pulp & Paper Dept. State Vocational School, Wausau, Wis.; A. McPhillips, Simonds Wordon & White Co., Dayton, Ohio; Hoke Martin, Mathieson Alkali Works, New York City; A. D. Merrill, Chemipulp Process, Inc., Watertown, N. Y.; Wm. W. Meyer, Connersville Blower Co., Chicago, Ill.; O. J. Mills, Sandy Hill Iron & Brass Works, Hudson Falls,

N. Y.; H. W. Mollison, National Tube Co., Chicago, Ill.; A. E. Montgomery, J. O. Ross Engineering Co., Chicago; J. J. Mulchsey, Flambeau Paper Co., Park Falls, Wis.; Arthur Murray, Container Corp of America, Chicago; C. E. Mueller, Paper Makers Chemical Corp., Kalamazoo, Mich.

A. J. Navarre, Minnesota & Ontario Paper Co., International Falls, Minn.; B. R. Neice, New York Color & Chemical Co., Belleville, N. J.; J. M. Nelson, Standard Oil Co., Duluth, Minn.; H. G. Noyes, State of Wisconsin, Madison, Wis.; C. H. Noble, Staley Sales Corp., Decauter, Ill.; Ray North, Green Bay Foundry & Mach. Works, Green Bay, Wis.; Jack Nylund, Chicago.

B. C. O'Brien, Connersville Blower Co., Connersville, Ind.; J. E. O'Laughlin, Mueller Brass Co., Port Huron, Mich.; C. R. Outterson, Bennett, Inc., Cambridge, Mass.

Jacob Parent, Noble Wood Machine Co., Hoosick Falls, N. Y.; M. L. Peterson, D. J. Murray Mfg. Co., Wausau, Wis.; F. Paristow, U. S. Rubber Co., 1790 Broadway, New York City; W. J. Peacock, Northern Paper Mills, Green Bay, Wis.; E. Peterson, B. F. Goodrich Rubber Co., Akron, Ohio; W. E. Phillips, Mathieson Alkali Works, Niagara Falls, N. Y.; N. E. Philpot, Duriron Co., Dayton, O.; E. L. Puffer, Heller Merz, Inc., Chicago, Ill.

R. Radsch, Appleton Mach. Co., Appleton, Wis.; H. T. Randall, Champion Coated Paper Co., Hamilton, Ohio; Michael Redmond, Kalamazoo Paper Co., Kalamazoo, Mich.; L. H. Reed, Escanaba Paper Co., Escanaba, Mich.; J. Reitzel, Morris Paper Mills, Morris, Ill.; George Raschek, Oswego Falls Corp., Fulton, N. Y.; George Rice, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.; A. Wm. Riedel, Gus Riedel & Son, Kalamazoo, Mich.; J. W. Raines, Lindsay Wire Cleaning Co., Cleveland, Ohio; Burr H. Ritter, Hooker Electrochemical Co., New York; L. W. Roberts, Cutler Hammer, Milwaukee, Wis.; John Rue, Hooker Electrochemical Co., Niagara Falls, N. Y.

H. A. Schauer, Hasco Valve & Machine Co., Milwaukee, Wis.; J. Schulein, Barber Colman Co., Rockford, Ill.; P. R. Scrieber, General Dyestuff Corp., Chicago, Ill.; H. M. Schuldes, Hoberg Paper & Fibre Co., Green Bay, Wis.; W. H. Server, Northwest Paper Co., Cloquet, Minn.; Charles M. Shipway, Wm. E. Hooper & Sons Co., Philadelphia, Pa.; C. B. Smith, Huron Milling Co., Kalamazoo, Mich.; P. G. Smith, Blandin Paper Co., Grand Rapids, Minn.; Edward Stansel, Provincial Paper, Ltd., Mille Roches, Ont.; O. P. Sather, Standard Oil Co., Duluth, Minn.; H. F. Schenk, Wm. A. Hardy & Sons, Fitchburg, Mass.; J. Schemerman, Cameron Machine Co., Brooklyn, N. Y.; M. O. Shea, Standard Oil Co., Kalamazoo, Mich.; H. W. Sherman, Northern Paper Mills, Green Bay, Wis.; James Wilson Shields, Standard Oil Co., La Crosse, Wis.; Wm. Shartless, Watab Paper Co., Sartell, Minn.; J. F. Shuman, American Cyanamid & Chemical Co., Kalamazoo, Mich.; J. A. Simpson, Champion Coated Paper Co., Hamilton, Ohio; H. A. Skinner, Marathon Paper Mills Co., Rothschild, Wis.; J. H. Slater, Escanaba Paper Co., Escanaba, Mich.; L. E. Smith, Nekoosa-Edwards Co., Port Edwards, Wis.; L. J. Smith, Thilmany Pulp & Paper Co., Kaukauna, Wis.; Roscoe H. Smith, Reliance Elec. & Eng. Co., Cleveland, Ohio; J. P. Strasser, Stein-Hall Mfg. Co., Chicago; A. E. Sodemann, Krebs Pigment & Color Corp., Chicago, Ill.; Howard Stansell, West Carrollton Parchment Co., West Carrollton, Ohio; F. H. Stall, Westinghouse Electric & Mfg. Co., Milwaukee, Wis., Tom Stirling, Paper Makers Chemical Co., Kalamazoo, Mich.; I. W. Stevens, Northwest Paper Co., Cloquet, Minn.; B. P. Steele, Pennsylvania Salt Mfg. Co., Philadelphia, Pa.; John Stack, Standard Oil Co. (Indiana), Chicago, Ill.; G. H. Suhs, Rhinelander Paper Co., Rhinelander, Wis.; K. A. Stough, Wisconsin Tissue Mills, Menasha, Wis.

W. H. Theroux, Williams Gray Co., Chicago; S. E. Tomczak, Flambeau Paper Co., Park Falls, Wis.; J. A. Turner, E. I. Dupont Co., Chicago; Geo. M. Trostel, Champion Fibre Co., Canton, N. C.; F. J. Timmerman, Northern Paper Mills, Green Bay, Wis.; Allen Thuerer, Appleton Woolen Mills, Appleton, Wis.; Geo. A. Thompson, Jr., B. F. Perkins & Son, Holyoke, Mass.; C. J. Thomas, M & M Paper Co., Marinette, Wis.; W. S. Taylor, American Cyanamid & Chem. Corp., Kalamazoo, Mich.

J. Underwood, Pennsylvania Salt Mfg. Co., Philadelphia.

George Van Calster, Fort Howard Paper Co., Green Bay, Wis.; G. J. VanLiew, Wadhams Oil Co., Milwaukee, Wis.; H. K. Vinton, PAPER TRADE JOURNAL, 123 W. Madison St., Chicago; C. Vicario, Nash Engineering Co., New York; Anton Vander Lasraschat, Hoberg Paper & Fibre Co., Green Bay, Wis.; Roy Vanderberg, H. & T. McCluskey & Sons, New Haven, Conn.; E. M. Vanderbert, Nekoosa-Edwards Paper Co., Port Edwards, Wis.; R. W. Van Kirk, Penick & Ford Sales Co., Kalamazoo, Mich.

L. G. Wood, Northern Paper Mills, Green Bay, Wis.; James A. Wise, Kalamazoo Paper Co., Kalamazoo, Mich.; N. F. Wilmot, Mathieson Alkali Works, Chicago, Ill.; C. H. Williams, Williams Gray Co., Chicago, Ill.; Ralph A. Wickins, Bird & Son, East Wolpole, Mass.; M. M. Whitman, Marathon Paper Mills Co., Rothshild, Wis.; Harry E. Weston, Paper Industry, Chicago, Ill.; Sidney D. Wells, Combined Locks Paper Co., Appleton, Wis.; Chas. F. Weitzel, Pennsylvania Salt Mfg., Philadelphia, Pa.; W. T. Webster, J. O. Ross Eng. Corp., New York City; H. C. Webber, Munising Pa. Co., Munising, Mich.; R. S. Watson, Allis Chalmers Mfg. Co., Milwaukee, Wis.; A. P. Wandtke, Heller & Merz Corp., Chicago, Ill.; A. W. Warren, Wausau, Wis.; C. P. Waite, Travelers Ins. Co., Chicago, Ill.; W. P. Wagner, Northern Paper Mills, Green Bay, Wis.; Washburn Weston, American Wringer Co., Woonsocket, R. I.; M. H. Waterbury, H. Waterbury & Sons Co., Oriskany, N. Y.; H. F. Weber, Link Belt Co., Chicago; Jos. V. Wedgewood, Manhattan Rubber Co., Neenah, Wis.; W. J. Weed, Electro Bleaching Gas Co., New York, N. Y.; John G. West, Cheney Biglow Wire Co., Springfield, Mass.; C. R. Whipple, Beloit Iron Works, Beloit, Wis.; Frank Whittiger, Ciba Co., Chicago; A. Wiekham, McAndrews & Forbes Co., Camden, N. J.

W. A. Yule, F. C. Huyck & Sons, Chicago, Ill.; J. N. Youngchild, Nekoosa Edwards Paper Co., Port Edwards, Wis.; C. E. Youngchild, Southern Kraft Corp., Mobile, Ala.; G. H. Young, Midwest Fulton Mach. Co., Dayton, Ohio; A. T. Yoder, Ontonagon Fibre Corp., Ontonagon, Mich.; Byron A. Yule, F. C. Huyck & Sons, Albany, N. Y.

John V. Ziemann, Marinette & Menominee Paper Co., Marinette, Wis.; J. P. Zelinske, Wisconsin Tissue Mills, Menasha, Wis.

Ladies in Attendance

The following ladies attended the convention:

Mrs. A. W. Agrell, Mrs. H. D. Banta, Mrs. R. C. Beam, Mrs. B. Beasley, Mrs. J. W. Born, Mrs. A. W. Bouffard, Mrs. P. D. Bradley, Mrs. Wm. H. Brydges, Miss Pearl Burgess, Mrs. Geo. N. Burridge, Mrs. C. H. Burrows, Mrs. A. A. Burrows, Mrs. F. H. Burrows, Mrs. G. L. Chamberlin, Mrs. H. C. Couch, Mrs. W. D. Dalrymple, Mrs. De Groot, Mrs. Edw. Don Dooven, Mrs. Fabien Don Dooven, Miss Dora Drews, Mrs. Robert L. Eminger, Mrs. Don Fairburn, Mrs. W. W. Fitzgerald, Mrs. E. P. Gleason, Mrs. H. W. Gochmauer, Mrs. W. B. Gueinzius, Mrs. W. B.

Hadley, Mrs. A. B. Handen, Mrs. John Hansen, Mrs. A. J. Hutchinson, Mrs. J. H. Jackson, Mrs. Harry Jacqmen, Mrs. M. Ketter, Mrs. Gus Klaus, Mrs. F. P. Knack, Mrs. John Maloney, Jr., Miss Geraldine McCloskey, Mrs. A. K. McNaughton, Mrs. John Meyer, Mrs. John Ninahan, Mrs. A. D. Murphy, Mrs. Geo. D. Nau, Mrs. C. H. Nystrom, Mrs. W. J. Peacock, Mrs. R. Radsch, Mrs. F. T. Ramsay, Mrs. C. J. Reuland, Mrs. Geo. Raschek, Mrs. George Rice, Mrs. Con Riggles, Mrs. F. H. Schuler, Mrs. F. Schwartz, Mrs. H. W. Sherman, Mrs. Chas. T. Simpson, Mrs. Harold Sinclair, Mrs H. A. Skinner, Mrs. J. H. Slater, Mrs. L. E. Smith, Mrs. O. C. Straubel, Mrs. W. S. Taylor, Mrs. F. J. Timmerman, Mrs. G. J. Van Calster, Mrs. E. M. Vanderberg, Mrs. W. P. Wagner, Mrs. S. D. Wells, Mrs. H. G. Wintgens, Mrs. L. G. Wood, Mrs. C. E. Youngchild, Mrs. J. W. Youngchild, Mrs. A. J. Allison, Mrs. E. N. Bechard, Mrs. Bernard Bornstein, Ethel Bradley, Mrs. L. H. Breyfogle, Mrs. H. H. Burrows, Mrs. C. J. Christianson, Mrs. Wm. B. Clements, Mrs. W. A. Crawford, Mrs. H. S. Diehl, Mrs. J. H. Dow, Miss Alice Dow, Mrs. T. W. Dunn, Mrs. Geo. C. Dunn, Mrs. Lewis Dozier, Mrs. L. H. Everlien, Mrs. V. R. Ewing, Mrs. Wm. P. Feeney, Mrs. L. P. Fortier, Mrs. W. A. Gocke, Mrs. M. H. Haskin, Mrs. E. C. Jacobi, Mrs. C. H. R .Johnson, Mrs. Natalie Joannes, Mrs. W. H. Kraske, Mrs. Peter Jones, Mrs. R. H. Kelly, Mrs. F. H. Knowlton, Mrs. Elmer Lenz, Mrs. John F. McKenzie, Mrs. A. McPhillips, Mrs. A. J. Navarre, Mrs. C. H. Noble, Mrs. Jacob Parent, Mrs. J. W. Raines, Mrs. Herbert Randall, Mrs. H. M. Schuldes, Mrs. J. R. Simpson, Mrs. Milton McGuire, Mrs. A. Vander Lasrachat, Mrs. G. J. Van Liew, Mrs. J. V. Wedgewood, Mrs. Byron A. Yule, Mrs. J. W. Stevens and Mrs. G. H. Suhs.

PREPARING FOR INDUSTRIAL CONTROL

(Continued from page 11)

so harmonized as to preserve the normal balance between the groups, may be established and maintained by the individual groups themselves with a minimum of Governmental direction. This resolution provides for a federated type of organization in the American Paper and Pulp Association in which membership will be established upon a group basis and financial support will be drawn from the groups in proportion to the net sales value of the groups. The Board of Governors of the new American Paper and Pulp Association will be drawn from the group representatives, who will function for the industry as a whole under the leadership of the President.

"Under these provisions membership in the American Paper and Pulp Association is possible only through membership in an organized group association. At the present time the groups in the industry are nearly completely organized and each is being rapidly put in shape to take care of the requirements of the law in respect to the particular needs of each group. This organization is fundamental to the welfare of the industry. If you have not already done so, you should ally yourself with the proper group organization."

News Print Manufacturers Organize

BOSTON, Mass., June 10, 1933.—At a meeting of 21 representatives of American news print manufacturing companies representing approximately 85 per cent of this country's news print capacity, held in Boston, the Association of News Print Manufacturers of the United States was organized. It appointed a committee to consider conditions in the industry and to formulate a code to meet the requirements of the National Industrial Recovery Bill now pending in Congress.

The committee consists of William A. Whitcomb, president of Great Northern Paper Company, (chairman); Edgar Rickard, president of the Pejepscot Paper Company, vice chairman; I. Zellerback, president of the Crown Zellerbach Corporation; A. R. Graustein, president of the International Paper and Power Company, and R. M. H. Robinson, receiver of the Minnesota and Ontario Paper Company. Messrs. Whitcomb and Richard represent the Eastern mills; Mr. Zellerbach the Pacific Coast mills; Mr. Graustein the New York mills, and Mr. Robinson the central district mills.

It was the sense of the meeting that the news print industry should be regarded as a separate entity and not as a part of a group embracing manufacturing of all kinds of paper products.

Waterproof Paper Association Formed

A meeting of the waterproof paper manufacturers was held at the Hotel Commodore, New York, on June 7, with over 75 per cent of the industry represented. They voted to organize a Waterproof Paper Manufacturers Association in order to cooperate with the rest of the paper industry under the National Industrial Recovery Act. They also voted to affiliate with the American Paper and Pulp Association.

An executive committee was elected as follows: Chairman, Fred P. Wood, Simplex Paper Corporation, Adrian, Mich.; Karl E. Stansbury, Thilmany Pulp and Paper Company, Kaukaun, Wis.; J. E. Cooke, Keystone Roofing Manufacturing Company, York, Pa.; E. H. Angier, Angier Corporation, Framingham, Mass.; A. M. Anderson, Sisalkraft Company. D. A. Crocker was elected manager of the association.

St. Lawrence Merger Disintegrates

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., June 12, 1933—Plans are steadily proceeding for the disintegration of the St. Lawrence Corporation merger, and the reversion of the operating subsidiaries to their former independent status. The "A" stock of St. Lawrence Corporation, which was exchanged by the terms of the merger for the stock of Brompton Pulp and Paper Company, showed considerable strength on the market during the past week, apparently discounting the recovery of the Brompton stock by shareholders. Brompton has a well diversified production of pulp, paper, and lumber, and appears to have good prospects for the future with signs of revival in general business conditions.

Missisquoi Corp. Complains

[FROM OUR REGULAR CORRESPONDENT]

PLATTSBURG, N. Y., June 10, 1933—A brief has been filed by the Missisquoi Corporation, of Sheldon Springs, Vt., with the Interstate Commerce Commission in which complaint is made against existing freight schedules on wood pulp between this city and Sheldon Springs. It is alleged that the rates over the Delaware & Hudson Railroad and the Central Vermont Railroad exceeded the aggregate schedules for intermediate ports. The brief requests the commission to determine new rates on pulp shipments and to compel the railroads to make reparation for past consignments.

B. C. Pulp Co. Sends Pulp to Japan

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., June 8, 1933.—The B. C. Pulp and Paper Company Limited has just dispatched 1,500 tons of pulp to Japan. The shipment was loaded at the company's Woodfibre docks on the S.S. Tohsei Maru.

Activities of Fox River Valley Paper Mills

Experiments Made at Institute of Paper Chemistry, Lawrence College, Appleton, Wis., Shows Use of Zinc Pigment Gives Added Opacity to Mail Order Catalog Paper—Work Being Continued by Institute on Greater Perfection of Process

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., June 12, 1933—Use of zinc pigment to give added opacity to thin mail order catalog paper has been worked successfully in experiments at the Institute of Paper Chemistry, Lawrence College, Appleton, Wis., collaborating with the New Jersey Zinc Company. Howard M. Cyr, of Palmerton, Pa., recently completed extensive laboratory work at the Institute on behalf of the zinc company.

This work was begun at the instigation of a mail order house and has since been carried through the experimental stage and into test runs in commercial paper mills. The zinc pigments were found to produce all the desired effects of whiteness to a greater degree than before, and of a high degree of opaqueness. It was further learned that the pigments do not weaken the sheet. Their mildly antiseptic character prevents growth of slime in pipes and vats.

Will Effect Big Saving

Use of the zinc coated paper will save the mail order house back of the project $35,000 on each issue of its catalog, and will mean an ultimate saving of unlimited amounts to the whole mail order industry. Work is being continued by the Institute on a greater perfection of the process.

Paper Making Through Eighteen Centuries

An exact replica of a hand paper making outfit as diagrammed in the book by Dard Hunter, entitled "Paper Making Through Eighteen Centuries" has been set up as part of the paper exhibit of the Paper Foundation, Inc., at the Century of Progress Exposition at Chicago. The Institute of Paper Chemistry, of Lawrence College, Appleton, Wis., has charge of this part of the display, and the actual making of paper by hand is being done by Martin Downs, of Reading, Pa., a student of the Institute.

The apparatus includes a large wood press weighing about 500 pounds, an easel, a table dryer, and a tub and rack. The sheets will be watermarked with moulds furnished by the Joseph J. Plank Company, Appleton, Wis., one the official emblem of the Institute of Paper Chemistry, two of the Century of Progress, one a special shadow mark of the Plank company, and two others, one of President Roosevelt and another of his signature. The first hand sheets with the last-named marks will be sent to the president.

Equipment for the hand paper division was financed by the Writing Paper Manufacturers Association and was made by the Kewaunee Manufacturing Company, Kewaunee, Wis., which also is sponsoring a companion exhibit of its own showing the contrast of present day laboratory equipment to that of early times. Modern testing apparatus also is being demonstrated.

The entire paper exhibit of two parts occupies a space of 75 by 20 feet parallel with the main corridor of the general exhibits building. A small paper machine loaned from the laboratories of the American Writing Paper Company, Holyoke, Mass., is kept in operation producing a sheet four inches in width. Display cases show the various uses of paper, with samples submitted by many mills. The other section of the exhibit contains the three room home made out of paper board, and containing furniture, furnishings and utensils made out of paper or fiber.

Among the Wisconsin men associated with the Paper Foundation, Inc., the non-profit corporation made up of mills sponsoring the exhibit are: Allen Abrams, Wausau, president of the Technical Association of the Pulp and Paper Industry; A. C. Gilbert, president of the Gilbert Paper Company, Menasha; Folke Becker, of the Rhinelander Paper Company; D. K. Brown, of the Neenah Paper Company, and Joseph M. Conway, president of the Hoberg Paper and Fibre Company, Green Bay.

Protest Freight Rate Increase

Protests against any increased scale of freight rates are contained in a brief filed with the Interstate Commerce Commission by the Wisconsin Paper and Pulp Manufacturers Traffic Association. These refer to the reopened investigation of class rates in the Western Trunk Line case. The association also opposes restoration of combination rates for through joint inter-territorial rates, and wants Extended Zone C maintained.

Important Riparian Decision

A decision important to the Marinette and Menominee Paper Company and the Union Falls Power Company, Marinette, Wis., was handed down by the state supreme court last week. It sets aside a jury verdict awarding $2,500 damages to Herman Radder, a riparian in the company's flowage area who sought compensation for the flooding of his lands above the mill dam on the Menominee River. Twenty-five similar cases were pending, which would have meant payment of a large sum to riparians if the first one had been established as compensatory.

Hoberg Docks Damaged

Damage amounting to several hundred dollars to the docks of the Hoberg Paper and Fibre Company, Green Bay, Wis., was caused last week when the steamer *W. J. Crosby*, arriving with a load of pulp wood, broke off a section of the piling. The swift river current caused the boat to swing out of control.

News of the Industry

Four degrees of doctor of philosophy and one of master of science were conferred by the Institute of Paper Chemistry at Lawrence College. Appleton, Wis., during the annual commencement exercises. Those awarded doctor of philosophy are: Roy Listen Davis, Athens, Me.; Harold Williamsh Bialkowsky, Holyoke, Mass.; Edwin R. Laughlin, Delaware, Ohio, and Edward Hugo Voightman, Sheboygan, Wis. The master of science degree was granted to Forest Wilbur Brainerd, Chester, Pa.

Mr. Bialkowsky was married last week at Appleton to Miss Erna Torno, of Holyoke, Mass. Upon return from his honeymoon, Mr. Bialkowsky will take charge of the laboratory at the Gilbert Paper Company, Menasha, Wis.

Lawrence College also conferred honors upon F. J. Sensenbrenner, president of the Kimberly-Clark Corporation, Neenah, Wis., by electing him a member of the board of trustees. He was one of the men instrumental in founding the Institute of Paper Chemistry.

Boston Paper Market Conditions Continue Firm

Wholesale Paper Merchants Receive More Inquiries for Various Standard Grades of Fine Paper —Book Papers Show Distinct Improvement—Demand for Kraft Wrapping Paper Expands Materially—Summer Specialties Moving Freely

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 12, 1933—Business among paper wholesalers in and around the Hub continued better during the week under review, some firms finding it "very much better." More inquiries were received. In a few instances the demand for fine paper slowed up a bit, but these firms had been doing very well the previous few weeks and evidently their customers are supplied for the time being. The general upward trend of prices makes it seem advisable to cover soon when possible. Book papers showed a distinct advance. There was a lively demand for box coverings, particularly for shoe boxes. The demand for wrapping paper improved greatly in some cases, with a fair call in others. Some lines have not started to move in any appreciable volume as yet, but they are expected to before long. Prices have stiffened a little in wrapping paper and corrugated rolls.

Summer specialties, such as paper napkins, drinking cups, fiber plates, spoons, plates and forks, moved actively. Seashore and mountain resort proprietors look for the best summer of the last three years, with reservations in greater numbers than in the last three seasons.

Those paper manufacturers of Massachusetts reporting their volume of business to the Associated Industries of Massachusetts, according to a recent announcement, showed an increase in May of 18 per cent over the new orders received in April.

At least a fair amount of business was transacted in box board. With the values of paper stock still rising, prices of board took a further advance. In some instances, manufactureres have withdrawn prices temporarily.

Paper Stock Generally Active

Paper stock continued generally active, with a particularly strong market for mixed shavings, mixed papers, old newspapers and corrugated boxes. There is some resistance to raised prices on the part of consumers. With the packers advancing their prices, the middleman must follow suit. Dealers complain that some mills are buying direct of the packers. In old papers, No. 1 mixed shavings have risen to .80 @ .90 compared with a former range of .60 @ .70, old newspapers to .57½ from a range of .45 @ .50, box board chips to .57½ from .45 @ .50 and screening wrappers to .57½ from .45 @ .50. In bagging, scrap sisal for shredding has advanced to 1.10, compared with .90.

The twine market was active, with prices stiffening.

H. S. Dennison Urges Unemployment Measure

Henry S. Dennison, of the Dennison Manufacturing Company, Framingham, Mass., appeared June 5 before the House Ways and Means Committee to support the bill providing for the establishment of unemployment reserves in this State and declared that the cost to employer under the terms of the legislation would approximate one-half of one per cent on his sales price. The bill before the committee was drafted by the Special Commission on the Stabilization of Employment and calls for the creation of a State fund made up of contributions on the part of employers of two per cent of their wage payments over a specified period for payments to workers during periods of unemployment.

In urging the measure, Mr. Dennison, who served as a member of the special commission, argued that the contribution was so small that it could be borne without trouble by the rank and file of the employers who come under the provision of the bill. "It has been said that such a payment would constitute the straw which would break the camel's back," Mr. Dennison said, "but if this be so the number of backs which would be broken would be extremely small."

He admitted that the existence of a fund such as that proposed would not go very far in meeting conditions such as have prevailed in the last three years, but he pointed out that the present economic depression has been one of monumental proportions and that with an ordinary business recession in progress the existence of an unemployment reserve fund would be of decided benefit. He warned the committee that if the proposition were left to the initiative of the employers themselves, nothing would be done because of the competition existing between them. Mr. Dennison urged that action on the legislation be taken now on the ground that if such action were delayed the return of prosperity would make it much more difficult of enactment.

News of the Trade

In the case of Train Smith Company *vs.* George W. Wheelwright Company, stockholders and creditors received a notice to appear at the Superior Court in Suffolk County at Boston, Friday, June 5, to show cause why the petition of George W. Wheelwright, Carl F. Woods and George Alpert, the receivers, to sell the Hardwick Mill and equipment at private sale should not be allowed. The meeting was held, but adjournment of a week was taken.

Ernest S. Reid was speaker at a recent sales meeting of the Fort Hill Paper Company. His subject was "Mountains of Spoons," in which he discussed the story of the products of the Kleen Products Company, manufacturers of paper spoons, forks and plates, at North Wales, Pa. Mr. Reid is the New England representative of the Kleen Products Company; Crystal Tissue Company, Middletown, Ohio, and the Hammersley Manufacturing Company, Garfield, N. J.

A. Bothe, president of the Kleen Products Company, was in town four days last week, visiting the many merchants who stock the Kleen Products line of spoons and forks.

The staff of Storrs & Bement Company enjoyed an outing at the Assabet Country Club, Stow, Mass., Saturday afternoon. Features of the occasion were sports, a dinner and dancing. About fifty were in the party.

Dr. Richard L. Rice, formerly connected with the Boston offices of the Brown Company, Portland, Me., has joined the sales staff of the Andrews Paper Company, 54 India street. He will specialize particularly in its exclusive lines of high grade papers.

W. L. Dawson, sales manager of the Hammersley Manufacturing Company, a recent visitor at the local office of the company, called on the trade.

The Marvellum Company, for which Henry L. Goodman is a New England representative, has issued Book No. 79, consisting of Flint papers for box coverings. These are fancy papers in buff, green, lavender, red, black, blue, dark blue, pink, red and black.

Ontario Mills Increase Operations Slightly

Provincial Fine Paper Manufacturers Operating at Approximately 50 Per Cent of Capacity—Demand for Various Standard Grades of Book, Bond, Offset and Ledger Papers Barely Sufficient to Keep Plants Running on Reduced Time at Present

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., June 12, 1933—While May closed with a distinct improvement in wholesale paper circles the trade seems to have run into a bit of a slump again as the holiday season is entered upon. The falling off in business, however, is looked upon as more or less seasonal and it is believed that had vacation time not arrived the spurt given to business during May would have been lasting. Sales began to fall off a little as June was entered upon and there were indications that paper consumers were coming into the market in greater numbers. At the moment, however, the market is back where it was, which means that orders are small for the most part and that the hesitancy in buying has been resumed.

The printing trade and other consuming sources are holding off buying until actual contracts for catalogs and direct mail advertising campaigns are in their hands and then they want supplies in a hurry. There is every indication that a lot of work for the printer and orders for paper are being held up pending definte proof that business in all commercial lines is on the up grade. Meanwhile the paper merchants are carrying on with a good deal of confidence that the summer months, despite the holiday season, are going to produce some real business. Prices are holding firm and there is less competition in paper lines than in other commodities.

In manufacturing circles some of the mills have been increasing their activities slightly, but it cannot be said that the fine paper manufacturing industry is operating at much more than fifty per cent of capacity. Some of the mills, of course, are doing better than that, and occasionally one hears of a mill running at around eighty per cent. The coarse paper mills are in the former class. Demand for coarse papers, paper bags and kraft is about as light as it has been for some months, although the production and sale of flour sacks is keeping up fairly well. In the fine paper market the call for book, bond, offset and ledger papers is barely sufficient to keep the machines running on reduced time. Converting lines are decidedly slow, manufacturing stationers reporting little, if any, improvement in demand. The envelope trade is decidedly quiet and a similar condition of affairs exists with regard to waxing, grease proof and glassine lines. Coated paper mills are quiet under a demand that has been the lightest for some time. Light weight paper lines are moving slightly better but there is room for a lot of improvement in demand for tissues, toilets, and tissues specialties. There has been no improvement in the paper box market, which has been dull for a long while, and this means that the call for box board and linings is light.

New Safety Engineer Appointed

At a meeting of directors of the Ontario Pulp and Paper Makers' Safety Association, held in Toronto, D. B. Chant, manager of the Espanola mill of the Abitibi Power and Paper Company, was appointed secretary-treasurer and engineer of the organization in succession to A. P. Costigane. It is stated that Mr. Costigane will retire August 1 and Mr. Chant will take over the duties on that date. Mr. Costigane has been the chief executive of the association for over seventeen years and his faithful and clever work as an engineer and close student of safety affairs in the pulp and paper industry has brought the organization to its high state of efficiency. He has many friends in the industry who will regret his retirement after long service in the interests of safe operation of the pulp and paper mills of the province. It is understood that after a well-earned rest he will follow his engineering profession in a private capacity.

Mr. Chant is considered well qualified to take over and operate the association in the interests of the safety department of pulp and paper operations. He has taken a keen interest in the affairs of the association for some years, during which he held important positions in various mills. His father was a lumberman and he began his own career in the woods department operations of the old Spanish Rover Pulp and Paper Mills, thence going into the mills and working his way up through various positions of responsibility.

Notes and Jottings of the Trade

The Ontario paper trade regretted to learn of the death in Hamilton, Ont., of Charles B. Martin, vice-president and general manager of the National Paper Goods Company, of that city. Deceased was 38 years of age and had lived in Hamilton for the past twenty years, where he was prominent in club and business affairs.

Albert Hinzke, manager of the sulphite mill at the Port Arthur Division of Provincial Paper, Ltd., passed away a few days ago. Deceased was widely known in paper manufacturing circles in the province and his death is regretted by the trade generally.

International Fibreboard, of Ottawa, a subsidiary of International Paper Company, reports a gain of no less than 98 per cent in total business for May as compared with the preceding month. The rush of the past few weeks is regarded as an indication that business is swinging back to normal.

International Power and Paper Company, of Newfoundland is reported to be considering a proposal put forward by the Newfoundland Railway to make Port aux Basques a terminal for the shipment of news print instead of Corner Brook. In 1928 it was proposed to develop Port aux Basques as a four months shipping port, but it is now understood that the company may consider the terminal as an all-year round port.

Seasonal demand by the Port Royal Pulp and Paper Company for pulpwood has resulted in between 400 and 500 men being given employment at Lepreaux, N. B. The company is purchasing 25,000 cords of pulpwood and it is expected that the men will be given steady employment for three months. The wood will be conveyed to the mill by rail.

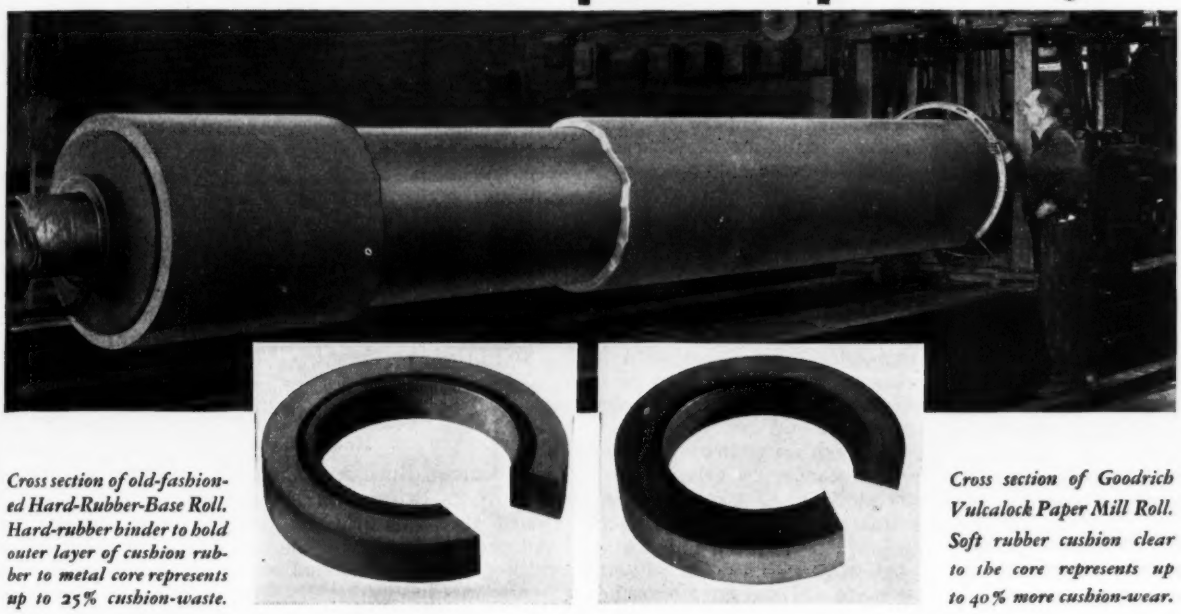
Paper Improves at Vancouver

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, Wash., June 10, 1933.—In a recent bulletin released by the Vancouver Chamber of Commerce here mention was made of the fact that industries were "sliding around the corner." Activity in the paper and pulp industry was cited as particularly on the uptrend. The saw-mill department of the Columbia River Paper mills is now giving employment to 120 men which is an increase over figures released some time ago. Crown-Willamette Paper mills has gone on a six-day week with 1,100 men getting in more time.

WHY CHEAT YOURSELF

. . . . when you buy rolls ?



Cross section of old-fashioned Hard-Rubber-Base Roll. Hard-rubber binder to hold outer layer of cushion rubber to metal core represents up to 25% cushion-waste.

Cross section of Goodrich Vulcalock Paper Mill Roll. Soft rubber cushion clear to the core represents up to 40% more cushion-wear.

NOBODY wants a rubber-covered roll, even from Goodrich, with a part of the rubber cushion removed. But that is precisely what you get when you pay for the old-fashioned roll with a hard rubber base. You are cheating yourself out of years of useful cushion-wear unless you insist on an over-all soft rubber cushion clear to the core. Because hard rubber is dead rubber, it has no resiliency—no cushioning properties.

You had to have it, however, on the older type of rubber covered roll, because there was no known method of bonding soft rubber to metal base. You had to buy a roll with, say, three-quarters of an inch of soft rubber cushion; which was vulcanized to a layer of hard rubber, a quarter of an inch thick; which, in turn, was fastened by shrinking the hard rubber into threads cut on the metal surface of the core.

The Vulcalock process, discovered and used exclusively at Goodrich, changed all that. It provides direct adhesion between soft cushion rubber and metal base of 500 pounds to the square inch. Now you can buy soft rubber cushion clear to the core, without cushion-waste, at about the same price you paid for the hard-rubber-base roll.

Why Goodrich Vulcalock rubber roll coverings will serve you longer and give up to 40% more cushion life should interest you. Write for the facts. The B. F. Goodrich Rubber Company, Mechanical Rubber Goods Division, Akron, Ohio.

ROLL COVERINGS—BELTING—HOSE—MISCELLANEOUS RUBBER PRODUCTS

Goodrich

ALL *products problems* IN RUBBER

Vulcalock *Paper Mill Rolls*

Demand for Paper Falls Off in Philadelphia

Acceleration of Purchasing Experienced During May Slows Up Slightly But Perceptibly—Paper Stock Prices Advance Materially, Especially Lower Grades—Board Quotations Higher, Due to Greatly Increased Cost of Raw Materials

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., June 12, 1933.—June opens with a slight but perceptible slowing-up in the acceleration of buying which had existed for the earlier weeks of May. But the gain for May over its preceding 4-week period was decided. In the case of Garrett-Buchanan Company and some others it aggregated as much as 20 per cent. In view of the fact that under ordinary conditions May barely holds its own with April, or shows some slight decline, the results of this particular year's experience is gratifying.

The coarse paper betterment was not quite as marked as was the fine paper, and the lapse of the past week, while more pronounced, was by no means a general setback. On the other hand, the paper stock dealers manifest an attitude of general satisfaction with the way things have been going. The last week particularly was signalized not only by a very decided increase in demand but by a betterment of prices which, unfortunately, thus far has only been restricted to the common grades. Mixed papers, for instance, this week attained their high water mark for the year at $10 a ton with a few instances of even higher prices—an increase from between $6 to $7 a ton early in May. The low water mark was as far down as $3.50 a ton in February reaching only $4 a ton in March and April, and then climbed slowly through May with a dollar to two dollar increase during the last week. Mixed are a scarcity on this market as also are commons. A curious condition exists, however, that because of the restricted demand for the better grades, the outside limit for these common papers is very close indeed. It is believed by many in the trade that unless there is a recession from present price levels of mixed and commons that an advance in the better grades is inevitable.

Board prices, of course, have advanced, and the mills have been compelled to offer the attraction of better prices for stock. While at present levels the stock dealers say that there is an opportunity for a slight profit for collectors, packers, and finally the wholesalers, they also believe that in the next few weeks there must come further advances unless all signs fail. In the rag market, the effect of better demand has resulted in higher prices, particularly in the cheaper grades.

Organizing for Recovery

Because of the attention now being focused on the National Industrial Recovery Act, William Simmons, of John Simmons Sons, long active in waste paper affairs, William J. McGarrity, of the Penn Paper and Stock Company, and a few others who are dominant in the wholesale packing market, conferred during the week, in order to revive the association which, in recent months, has been most inactive. Some thought has been expressed that it might be found mutually advantageous to organize a waste paper division in the Philadelphia Paper Trade Association which, with the accession to its ranks of almost all of the larger coarse paper dealers, is now thoroughly representative of the industry in its best estate.

During the week it developed that the National Paper Box Manufacturers Association, with headquarters in the Liberty Trust Building here, has placed in motion a program designed to lend unqualified support to the National Industry Recovery Act. Howard P. Beckett, commissioner of the association, which represents 80 per cent of the paper-box manufacturers in the United States with an annual output of $210,000,000 in normal times and a payroll of 80,000 persons, said that a committee will form and adopt a code to be brought before the annual convention in Chicago in July and that approval will doubtlessly be given. William P. Datz, Jr., of the Datz Manufacturing Company, is president, and Walter H. Deisroth, of the W. H. Deisroth Company, is treasurer; both are Philadelphia firms. Meanwhile, ten or more coarse paper houses which recently decided to join the Philadelphia Paper Trade Association, supplanting the informal organization they created some months back, met on Wednesday of last week about the dining table. An address of welcome to the Philadelphia Paper Trade Association was made by its president, William A. Hentz, and brief remarks also were made by Butler Smythe.

News of the Trade

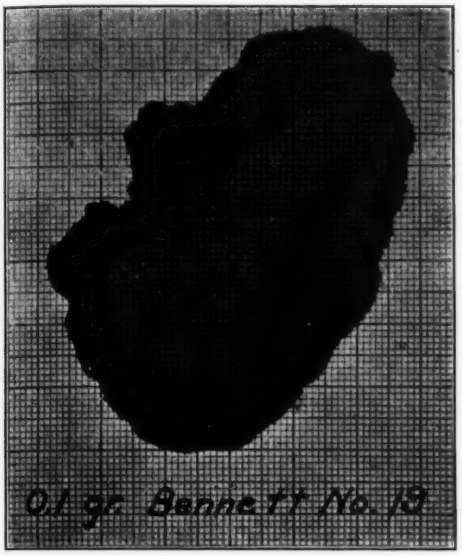
The Garrett-Buchanan Company has completed renovation of its exterior in buff, brown and blue. At the close of May, this firm went on a 5-o'clock closing basis.

All the employees of the J. L. N. Smythe Company picnicked together in annual outing on Saturday on private grounds in Chestnut Hill. Upwards of twenty-five employees journeyed to the picnic grounds in private automobiles and in the firm's trucks, for an afternoon outing, luncheon and a dinner.

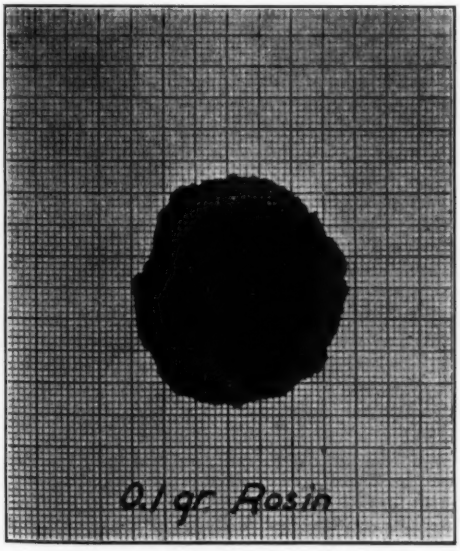
The Philadelphia Paper and Cordage Association had a meeting of its officers at the Hooper Paper and Twine Company's headquarters, 105 Church street, at which time definite arrangements were made for their combination monthly meeting and outing on June 16 at the Bankers' Country Club, Ambler, Pa. Invitations have been sent to the Philadelphia Paper Trade Association to join them as well as a number of other paper and twine houses in Philadelphia. Leslie C. Bartlett, chairman of the Entertainment Committee, has made final arrangements for suitable prizes to be awarded to those that carry off the honors in the events scheduled. Fred. I. Brower, 910 Chestnut street, is chairman of the membership committee, and is actively engaged in increasing the membership of this association. George W. Ward, of D. L. Ward Company, 401 North Broad street; J. R. Howarth, of the J. R. Howarth Paper Company, Inc., 804 Sansom street, and O. Kai Madsen, Philadelphia representative of the Badger Paper Mills, Inc., Peshtigo, Wis., have been taken into its membership this past week.

The Moore White Company has recently installed one of its latest improved sheet pasters for combining board, in the mill of the S. Austin Bicking Paper Manufacturing Company at Downingtown, Pa. This machine is the last word in design and principle, being ball bearing equipped throughout, having postive control of applying pasting agent; it is very economical in power consumption and amount of silicate used at greatly increased operating speed and reduced operating cost, suitable for any thickness of board;—this machine answers a long awaited want of the board industry.

COMPARE THEIR SPREADING POWER



Photograph showing actual area covered by one tenth of a gram #19 Bennett Rosin-Wax Size at 200° F.



Photograph showing actual area covered by one tenth of a gram of Rosin Size at 200° F.

BENNETT

TRADE MARK

ROSIN-WAX SIZE

The lower melting point of Bennett Rosin-Wax Sizes makes them more efficient at the drying temperatures normally employed on the paper machine. The photographs on the left show that, at 200° F. No. 19 Bennett Size covers almost three times as much area as Rosin Size. At lower temperatures the difference is still greater.

This is one reason why when using Bennett Rosin-Wax Sizes:

1 *less size is required for a given degree of sizing,*
2 *the cost of sizing per ton of paper is lower,*
3 *more uniform results are obtained,*
4 *lower drying temperatures are required.*

Less size also means lower alum consumption.

Lower drying temperatures mean lower steam consumption.

Bennett Incorporated
CAMBRIDGE, MASS., U. S. A.

Bennett Limited
CHAMBLY CANTON, P. Q., CANADA

Chicago Paper Market Gains Are Firmly Held

Demand for Various Standard Grades of Fine Paper Broadens—Book Papers, Sulphite Bond and Cover Papers, All Continue Active—Tissues Moving In Fairly Heavy Volume—Paper Board Industry Expands—Paper Stock Division Buoyant

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., June 12, 1933—Worthwhile gains made by the Chicago paper market during the past two weeks were firmly held during the past six days. The strengthening procedure that included kraft, sulphite bond, and other grades of paper continued and a firmness seems to have more or less permanently settled on the market. Prices are also more firm in ground wood this week, according to reports from local offices and, in some instances, the stiffening has recorded five dollars a ton advances. Each slight strengthening results in a new flood of orders indicating clearly the buyer's position and the possibilities ahead if all gains in all markets can be held.

Fine papers had a steady week of it, demand broadening out and reaching into industries which had, heretofore, been far behind in buying. Encouraging reports come from Stein-Hall Manufacturing Company where the paper mill buying is reported very favorable. Books and covers were firm. Tissues and toilet papers also materially bettered their position. The paper board industry is finding a new demand in the efforts of breweries to cultivate home trade with small packages of the bottled beverage. Otherwise the market is holding firmly. The waste paper market also broadened out a bit during the week.

Fiber Container Makers Meet

Manufacturers of corrugated and solid fiber boxes, independent and open container divisions, spent an entire day in Chicago the latter part of May going over the problems confronting the industry. The sessions, which were unusually well attended, were held at the Congress Hotel. Manufacturers of corrugated and solid fiber boxes heard an interesting report submitted by the Planning Committee of the Container Industry, which included J. B. Fenton, chairman, Hinde & Dauch Paper Company; C. A. Agar, Agar Manufacturing Corporation; J. M. Arndt, Robert Gaylord, Inc.; J. L. Barchard, Hammel & Downing; R. H. Dollison, Fairmont Box Company; Irving Hill, Lawrence Paper Company; J. O. Hoerner, Iowa Fibre Box Company; F. J. Kress, F. J. Kress Box Company; and Samuel Samuels, American Corrugated Paper Products Corporation.

The committee recommended that the fibre container manufacturing industry be reorganized with a view to presenting a solid front, truly representative of the industry, in connection with pending legislation contemplated in the National Industrial Recovery Act. The meeting went on record as being in favor of supporting in principle the plan which was presented by the planning committee relative to self-regulation of the industry in cooperation with the Federal government.

The understanding reached was that a further meeting of the industry would be held at an early date for the purpose of perfecting a plan of organization in connection with this important matter. A copy of the report, forwarded June 7, has been forwarded by Chairman James B. Fenton to all manufacturers of corrugated and/or solid fiber containers.

Meetings of the independent container division and the open container division of the Association were also held during the same day. The independent group, manufacturers without mill connections and container connections, was presided over by President M. M. Madson. It was well attended and that the independent group idea is a popular one is indicated by the fact that 22 manufacturers and fifteen independent mills have enrolled in the division, organized in March, 1933. Seven companies have enrolled as associate members. A feature of the session was the attendance of H. F. Kent and G. M. Simpson, of Paper Products, Ltd., Sydney, Australia, who reviewed the situation in Australia.

The Open Container Division was presided over by President G. R. Browder. The report of Henry D. Schmidt, delegate from the Paperboard Industries Association, to the annual meeting of the Uniited States Chamber of Commerce, was one of the interesting features of the session.

The next meeting of the association will probably be held in the East and possibly Atlantic City. It is likely to be held the latter part of this month and will include all members of the Container Division of the Paperboard Industries Association.

Paper Exhibit Attracts Visitors

The tiny paper machine which the Hammermill Paper Company installed in the Paper Exhibit at the Century of Progress, complete in every detail, is proving one of the popular focal points of the entire Fair. Thousands have already visited the paper exhibits in the General Exhibits building and nearly all of the interested spectators have been eager to watch James Miles and John Norris put the machine through its paces. The long series of handsome showcases containing samples of all the varied products of paper manufacturers is rapidly reaching 100 per cent capacity as individual exhibitors, now convinced that the Exposition exhibit is an actuality, are beseiging the Paper Foundation with requests for space.

The House of Paper, not in its final stage of completion at the time of the dedication last week, is now set to go. Furniture made of paper, paper rugs, paper fixtures, paper curtains, paper utensils, are now further set off by a flower bed with flowers constructed of paper. The 17th century method of making paper, furnished by the Institute, is also attracting a great deal of attention, while the effectively displayed signs portraying the greatness of the paper industry and the many uses of paper are proving invaluable advertisers for the seventh largest industry.

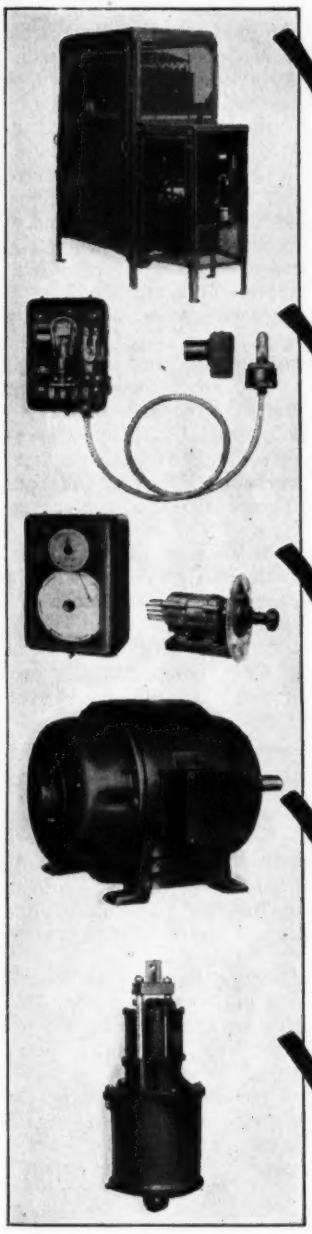
Both W. B. Wheelwright and Mr. Clinch, who are stationed at the exhibit, report unusual interest in the entire display and say that comments indicate the universal lack of knowledge of the prominence and technical details of the industry itself. "It is really the first time," says Phil Howard, managing director of the Foundation, "that the paper industry has got right up on the counter and talked directly to the ultimate consumers of its product. If you don't think its a good thing for the industry watch those people spend as much as an hour going over every detail of the exhibit."

News of the Trade

The second of the summer golf tournaments of the Salesmen's Association of the Paper Industry, Middle West Division, got away to a flying start this week with the mailing out of a clever announcement by Bill Tilden, chairman of the golf committee. Although the June event isn't until Friday, June 23, over the Sunset Ridge Country Club

Check

these G-E money-saving equipments



CAPACITORS—If you have a power-factor penalty clause in your power contract, or if operating conditions result in excessive voltage drop on the motor feeders, check the power-factor. If it's low, you can improve it simply and easily by installing a G-E Capacitor. One manufacturer installed a 480-kv-a. capacitor at a cost of $6,318, and the savings on power costs alone paid for it in less than one year.

PHOTOELECTRIC RELAYS—Electric eyes—will solve dozens of your perplexing problems. For example, they may be used to detect breaks of the paper on paper machines; to count boxes, bags, or sheets; to sort objects according to size, color, or shape; to compare or analyze color; or to control the registry of cutting, printing, or wrapping machines.

SELSYN DEVICES—Small, compact, easily installed devices which will tell you at a glance the level in tanks, reservoirs, or sumps situated at remote points. The modern electric paper-machine drive has Selsyn control throughout, while the mechanical drives may be equipped with Selsyns to make "draw" changes from the front side of the machine.

SPLASH-PROOF MOTORS—Designed especially for tough spots — places where open motors cannot be used because of splashing or dripping liquids. The frame and end-shield openings are protected by covers, and a splash-proof conduit box protects the power connections so that liquids cannot splash or drip directly into the windings. Cartridge-type ball-bearing housings make it unnecessary to expose the bearings even when disassembling the motor, and assure long bearing life and low maintenance.

THRUSTORS—Self-contained motor-driven devices that exert a smooth, powerful, straight-line, cushioned thrust. Thrustors are applicable wherever you now use hand- or foot-operated pedals, levers, hydraulic cylinders, or solenoids. They are used to operate paper cutters, and valves controlling white or black liquors, water, steam, oil, or stock. They are available in a large number of sizes. The largest will deliver a thrust of 6400 lb. through a stroke of 64 inches.

If you would like additional information on any of these G-E money-saving equipments, address the nearest G-E office, or General Electric Company, Schenectady, N. Y.

200-698

GENERAL ELECTRIC

course, Bill uses a "Vas You Dere, Sharlie" to tell about the fine initial party at Bob-O-Link and to urge attendance at the June festivities. A comic drawing made the mailing piece stick out from one's desk like a sore thumb. Attractions, as listed in the folder, are "luncheon, green fees, dinner, prizes and singing lessons."

The SAPEYES, as the Salesmens Association dubs itself, will continue their weekly luncheon meetings right through the summer, or at least as long as Congress and national affairs continue to make the times unusually interesting. Ordinarily June 12 would see the termination of the weekly session until the Fall but President Harold Knott and Vice President Creighton Whiting believe too much is going on to forego the value of the weekly interchange of ideas and the important digest and crystallization of happenings—both national and marketwise.

The middle western territory is greeting a newcomer in the person of Edward C. Rohrs, who is handling the sales of Whiting & Cook, Inc., paper converters, of Holyoke, Mass., in this territory. H. R. Boyce will represent the company in the larger business centers west of Kansas City. The Chicago office of Whiting is at 445 Plymouth Courti.

The Miami Valley Coated Paper Company has introduced a new embossed cover stock in three finishes and eight strong colors into the Chicago market through its local distributors. The new stock is known as Duralite Duplex and is quoted as being exceptionally tough while retaining the proper pliability.

The fourth of a series of essays on quality standards in American business has reached the Chicago market from the Rag Content Paper Manufacturers by way of the interesting sheet, "Rags in Paper." This one is written by J. J. Atkinson, vice president of the Hotel St. Regis, New York, and measures up quite satisfactorily with the first three of the "quality" series—all of them being particularly useful in putting over the idea of the need of quality—in all business as well as in the use of paper.

Paper men around the Conway Building are glad to see Joe Cowhill up and around again. The popular sales representative of Tomahawk Kraft Paper has been laid up for some time with a serious illness. The illness terminated in an operation for gall stones and it was only a little over a week ago that Mr. Cowhill got out and around again.

Lafayette Box Board Co. Reopens

[FROM OUR REGULAR CORRESPONDENT]

LAFAYETTE, Ind., June 12, 1933—Reopening of the Lafayette Box Board Company plant here, one of the community's major industries, has been announced. The plant has been closed for the last 18 months. Operations will begin as soon as machinery and mill can be reconditioned, and 100 men will be given employment permanently.

The plant is reopening as a subsidiary of the Alton Boxboard and Paper Company of Alton, Ill., with G. G. Otto of Alton as general manager; R. H. Breyfogle, as general superintendent, and M. W. Swaim, as sales manager.

The plant will manufacture container board and various grades of chip board for general market uses. Already much business has been booked officials stated.

Sefton Container Plant Busy

[FROM OUR REGULAR CORRESPONDENT]

ANDERSON, Ind., June 12, 1933—Business is reported good at the Sefton unit here of the Container Corporation of America. The factory has been operating five days a week. Rise in prices has stimulated buying. Both factory and offices are operating on a summer schedule, closing at 4 o'clock each afternoon.

Seasonable Lines Move in Indianapolis

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., June 12, 1933—Hot weather last week, which broke all existing June records, coupled with a holiday because of a repeal election, hampered paper business during the week, though from retail sources comes the report that summer specialties are moving briskly. The passage of the industry recovery act has caused some of the trade to be very optimistic and apparently all are hopeful the bill will fulfill all advance advertising for it. The fact that the country is off the gold standard does not seem to worry the local trade a bit. Jobbers say they will be perfectly willing to accept silver, nickel or copper in payment of accounts. Or a check, if good, will be taken.

With a slight increase in the fine paper field, there has been a disposition finally to make a profit on sales. Some dimunition can be seen in the prevalancy of cut-throat competition, though there still is too much. The jobbers here are none too well stocked and continue to depend on turnover and low stocks, a policy that likely will maintain so long as there is no indication of a soaring price market. It is doubtful if for years there will be anything like the large stocks carried that were in vogue during the balmy years of the twenties.

Incidentally the paper men are looking with hope on some decrease in postal rates. For some time now direct mail advertisers have been under wraps due to heavy postage costs and any decrease will stimulate this business, much of it which calls for fine paper. There is quite a noticeable increase in newspaper advertising, however, and papers not only here, but in all the larger industrial centers are using more print.

An expanding market is seen in the container trade. Prices are steady and more and more users are placing orders. In fact the container field looks more promising than it has since the debacle started.

Little change is seen in the paper stock field. Dealers say buying prices are not to their liking, but they are doing some business and hoping for better mill prices eventually. A large supply of stock now is on hand here.

Finch, Pruyn & Co. Busy

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., June 10, 1933—A drive is now under way on the Hudson River which will furnish the local plant of Finch, Pruyn & Co., with several thousand cords of pulpwood. The company maintains an extensive tract at Newcomb where the drive started several days ago.

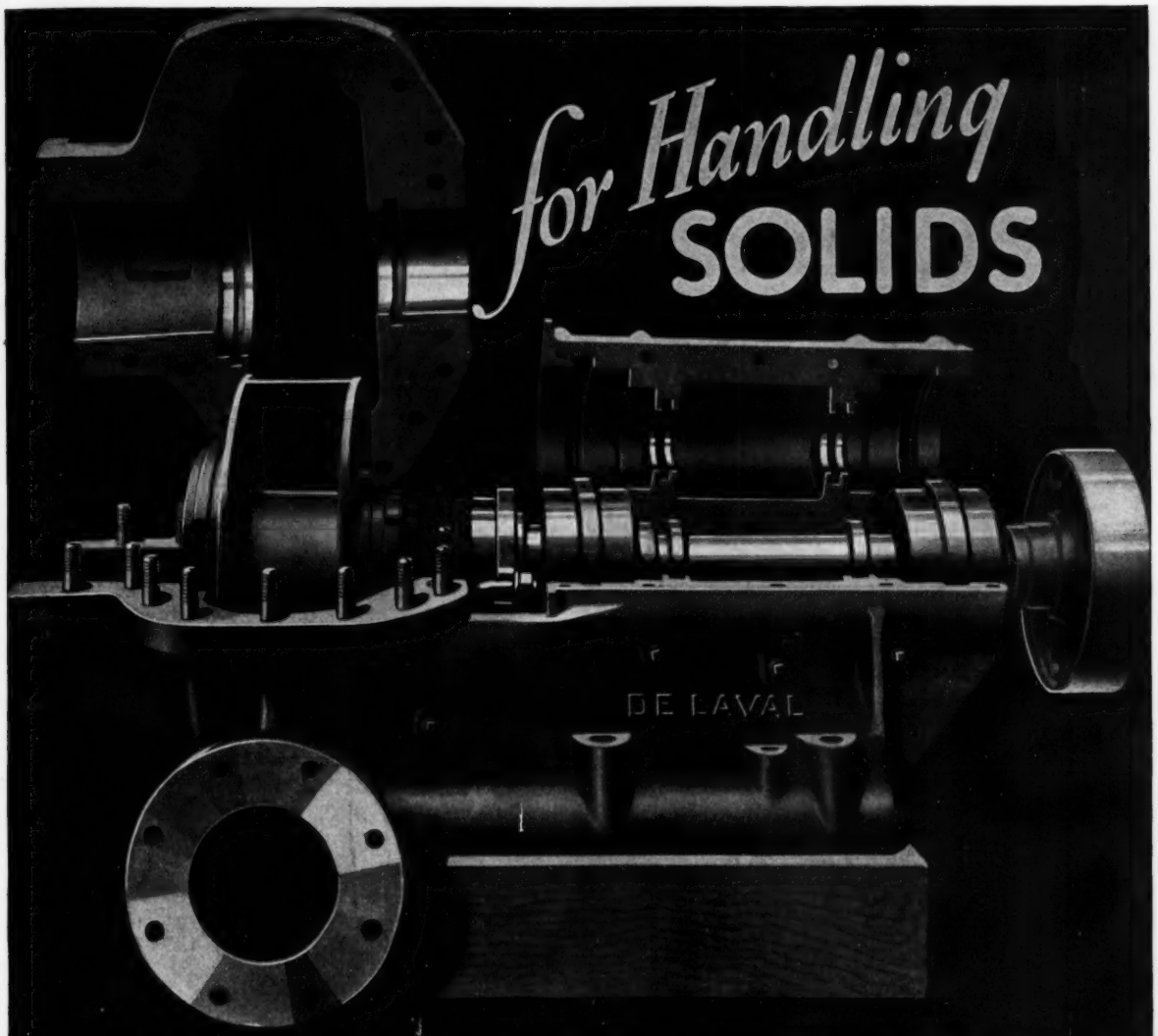
The local company is among the few concerns in this section which obtain its pulp wood needs from the Adirondacks as in recent years there has been a tendency on the part of numerous firms to secure foreign importations.

Orders for news print are aiding in keeping the local plant busy. During the past week a vessel was loaded with the product at the terminal here for shipment to customers and indications for a busy season on the waterway are bright.

To Start Paper Mill at Childsdale

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., June 12, 1933—Private plans are being prepared for the rehabilitation of a paper manufacturing plant, rooming houses and seven residences in the village of Childsdale, Kent County, near Grand Rapids. Plans for the project to cost about $200,000 are being worked out by Muskegon interests.



for Handling SOLIDS

A SIMPLE and ACCESSIBLE PUMP

THE casing of the DE LAVAL CLOGLESS PUMP is split horizontally and the top half can be lifted off without disturbing suction or discharge piping. Then, after removing the bearing covers and disconnecting the shaft coupling, the rotating member, with the removable wearing rings and the bearings, can be lifted out.

Dismantling and replacement can be performed by any ordinarily intelligent man, as all parts are interchangeable, being made to limit gages, and the casing cover is located by tapered dowel pins.

The pumps are furnished in either the vertical or the horizontal type.

DE LAVAL STEAM TURBINE CO.,
Trenton, New Jersey

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NEWS PRINT OUTLOOK

With the news print industry sharing moderately in the general business "pick-up" which is now evident, and with the news that co-operative steps are being taken by United States news print producers to formulate a plan of action in the industry that would conform to the demands of the National Recovery Bill before Congress, some rift is observable in the clouds hanging over the operations of pulp and paper concerns in Canada.

As regards the first point, the Dominion Bureau of Statistics reports that there has been a gain in the output of news print of more than 8 per cent, after seasonal adjustment. As to the second point, it is regarded as probable that a higher selling price will be fixed for news print by American mills, and that as a consequence the United States Government will take steps to ensure that Canadian news print will not come in at prices below those being asked by domestic operators.

Apart from these factors much is said to be doing behind the scenes which will make for the ultimate rehabilitation of the industry. R. O. Sweezey, through whose genius the great Beauharnois Power Scheme was evolved, and who, through political developments, has lost control of that giant corporation just as it has come into production, is now turning his great organizing abilities in the direction of the news print field. He is an acknowledged authority on the subject. In 1931 he was president of the Canadian Forestry Association, and he has figured as a director of the Port Alfred Pulp and Paper Corporation and of the Lake St. John Power and Paper Company.

It is now said that he is taking a hand in the reorganization of Price Brothers & Co., long one of the dominant factors in the news print and lumber industries of Eastern Canada. With him, it is said, is associated Lord Beaverbrook, who holds important contracts with Price Bros. & Co. for the *London Daily Express* and other papers in the Beaverbrook chain in England. There are those who think that Mr. Sweezey may ultimately figure as the long-awaited dictator in the news print industry in Canada. He is said to have far-reading ideas in this connection—ideas which he did not feel free to pursue while he was the directing head of the Beauharnois Corporation.

From other sources it is learned that one of the principal stumbling blocks which have been delaying a drastic reorganization of the industry consists of the large wood piles possessed by various companies who are heavily indebted to the banks. The banks, anxious to ensure a substantial reduction of this indebtedness, have insisted on these wood piles being used, and the companies on their part have considered it wise to do so rather than attempt capital expenditure for cutting wood for the concentration of news print manufacture into a few low-cost mills.

The wood piles, however, are steadily disappearing. Ultimately it is expected that as they disappear every one of the high cost mills will be closed down, and production confined entirely to mills so equipped and situated that large savings can be effected by running them at capacity.

This will mean the disappearance of the bogey of overproduction and the eventual salvation of the industry.

FOREIGN TRADE IMPROVES

April exports of paper and paper products from the United States totaled $1,052,357, a 12 per cent decrease over the March figure, and a 28 per cent decrease over the corresponding month last year, according to the Paper Division of the Department of Commerce. Tissue and crepe paper exports were twice as high as in the preceding month, while surface coated papers showed a 54 per cent increase, boxboard, 47 per cent, and overissue and old newspapers, 43 per cent. Slight increases over the preceding month, but heavy decreases over a year ago occurred in greaseproof and waterproof papers, sheathing and building paper, and cash register and adding machine paper, while slight decreases compared with the preceding month, but heavy decreases when placed beside the figures of a year ago are shown in paper towels and napkins, filing folders, index cards and other office forms and paper bags.

Items which showed heavy decreases both when compared with corresponding month in 1932 and the preceding month included wrapping paper, toilet paper, bristols and bristol board, other paper board, other writing paper, wall paper, boxes and cartons, vulcanized fiber sheets, strips, rods and tubes, news print, book paper, not coated and cover paper. Exports of fiber insulating board or bat amounted to $73,949, a slight increase both over the preceding month and a year ago.

April exports of paper base stocks were valued at $260,491, representing a decrease of 18 per cent compared with March and a 10 per cent decrease compared with April, 1932. Pulpwood exports were very light, amounting to only $10,737, a decrease of 70 per cent over a year ago and

30 per cent decrease over March. Exports of sulphite wood pulp showed a slight increase over the corresponding month last year but a 20 per cent decrease when compared with the preceding month. A 50 per cent increase was scored by soda pulp over the March figure, while representing a very heavy decrease over April, 1932. Exports of rags and other paper stock were heavier by 37 per cent compared with March.

Imports of paper and paper products in April totaled $5,867,650, a heavy decrease over last year's corresponding month but a 12 per cent increase over the preceding month. News print imports were 20 per cent higher than in March, but considerably lower than a year ago. March imports of cigarette paper, books and covers were valued at $162,917, a 45 per cent decrease over March. Slight increases over the preceding month's incoming shipments are shown in greaseproof and waterproof papers, other wrapping paper, surface coated papers, uncoated papers, decorated or embossed, papier mache and pulp manufacturers and tissue and crepe papers not over six pounds to the ream. Heavy decreases both over the preceding month and the corresponding month last year occurred in paper boxes, duplex decalcomania papers, not printed, wall paper, paper and envelope combinations, writing and drawing paper and Kraft wrapping paper.

April imports of paper base stocks amounted to $2,411,558, a 23 per cent decrease compared with that of a year ago and an 18 per cent decrease compared with the preceding month. Pulpwood imports were valued at $103,231, a slight decrease from the March figure but a heavy decrease from that of a year ago. Imports of ground wood pulp, unbleached show a slight increase over the preceding month but a heavy decrease compared with a year ago, while the bleached registered heavy decreases both over the preceding month and the same month last year. Bleached sulphite imports totaled $1,021,406, a decrease of $399,459, when compared with the preceding month and a decrease of $191,175 when compared with April, 1932. A very heavy decrease is shown in the April receipts of unbleached sulphate pulp over the preceding month and also over the same month last year, while bleached sulphate imports with a valuation of $170,262 were slightly lower than a year ago, but 25 per cent higher than in March. Soda pulp imports were considerably higher than in the preceding month and also when compared with a year ago, while rags for paper stock showed a slight increase over March but a heavy decrease over April, 1932.

Japanese Paper Production

WASHINGTON, D. C., June 12, 1933—Production by mills of the Japanese Paper Manufacturers Association during February totalled 55,921 short tons and sales 55,995 short tons as against 56,765 short tons and 64,625 short tons respectively in the preceding month. During the corresponding month of last year production totaled 52,485 tons and sales 55,708 tons. In addition to the paper turned out, the mills also produced 21,845 tons of chemical pulp and 18,627 tons of mechanical pulp during February. Production during February last year for the former was 17,637 tons and for the latter 16,303 tons.

Report on Paper Competition

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 14, 1933.—The United States Tariff Commission has sent a report to the Senate presenting a picture of foreign competition on paper which is believed in some quarters might seem to justify President Roosevelt in reducing duties on several grades of paper. Figures given in the report are not interpreted and it is thought that they might be used with serious effect adverse to the paper industry.

The Senate resolution asked for a list of commodities of which the imports are less than 5 per cent of the American production, and for statistics on such commodities. The theory is that such commodities do not need protection, or have duties which are too high to permit competition. Among those listed in the report are book, tissue, fine and wrapping papers. From the report of more than 400 pages are given below the grades of paper and the percentages of imports as outlined by the Commission:

Grade	*Percentage of Imports*
Book	Less than 1
Leatherboard	Less than 1
Wall Board	Less than 1
Roofing paper	Less than 1
India and Bible	Less than 5
Cellulose wadding	Less than 1
Tissue	1.6 per cent
Coated (Decorated)	Less than 1
Gummed	Less than 1
Simplex Decalcomania	Less than 5
Greaseproof, etc.	Less than 1
Basic photographic	Less than 5
Fine, including Bristol	Less than 1
Papeteries	Less than 5
Hanging	Less than 1
Wrapping	Less than 1
Blotting	Less than 1
Cover	Less than 5
Processed Boards	Less than 5

Flax Li Num Plant Sold

[FROM OUR REGULAR CORRESPONDENT]

ST. PAUL, Minn., June 8, 1933—The Waldorf Paper Products Company has purchased the plant and 10-acre tract of the defunct Flax Li Num Insulating Company, P. A. Schilling, general manager of the paper company, announced last week.

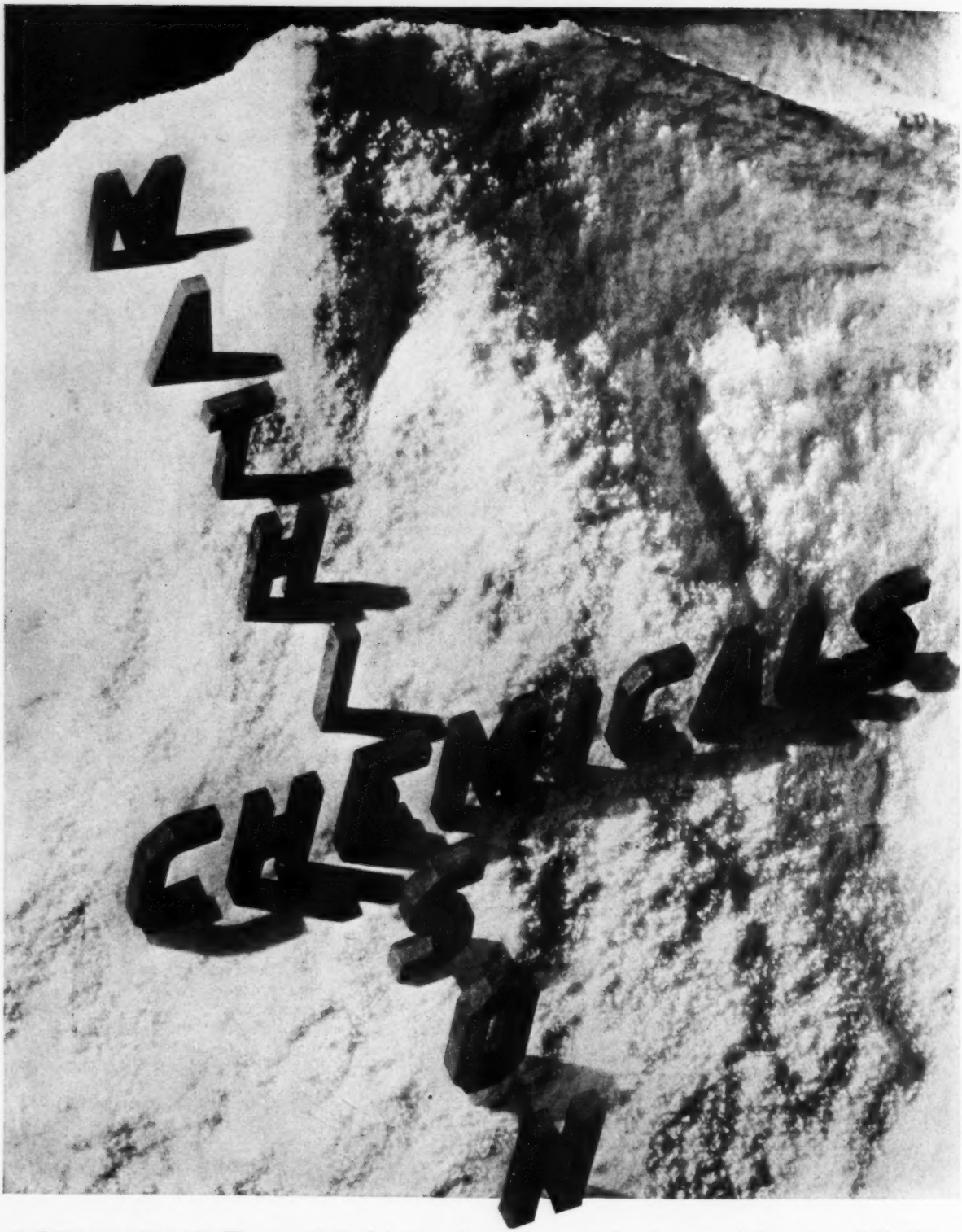
Mr. Schilling said the purchase does not indicate an expansion of the paper company's activities and added that manufacture of Flax Li Num products was not contemplated in the newly purchased property. The purchase price was not made public.

The plant has stood idle for about a year. It is bounded by Raymond, Hampden and Wabash avenues and the St. Paul road tracks. The buildings include a fireproof two-story main brick building and numerous storage sheds. The Waldorf company contemplates using it largely for storage purposes, Mr. Schilling said.

Int'l Pulpwood Co. Registers

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., June 8, 1933.—The International Pulpwood Supply Company has taken out registration papers at Victoria, B. C. as an extra provincial company. Papers show the paid up capital of the company to be $5,000 and its head office at 343 Sansome Street, San Francisco, Cal., with British Columbia offices at 1318 Standard Bank Building, 510 West Hastings Street, Vancouver.



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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

The Properties of Paper Pigmented With Zinc Sulphide

By Howard M. Cyr[1]

When the superintendent of the paper mill desires to color his paper, there are two methods at his disposal; namely, the addition of pigment or the use of dyes. If he desires a yellow color, he has his choice of a pigment such as chrome yellow or a dye such as Auramine. For a blue tint he might use either an ultramarine pigment or a dye such as "Methylene Blue." The dyes cost more per pound than the pigment and they do not add to the weight of the paper product. In spite of these facts, dyes have largely superseded the use of pigments due to their tinctorial power and the small amount needed.

On the other hand, when the superintendent wishes to whiten and brighten his product to a greater degree than is feasible with bleach, he finds that there is no such thing as a white dye but that a white pigment must be relied upon. When the field of white pigments is surveyed it is also noticeable that certain of them have in addition to their whitening and brightening power a very high obscuring power which adds the very desirable quality of opacity to a white paper. It was with these characteristics in mind that work was started over a year ago by The New Jersey Zinc Company at the Institute of Paper Chemistry in Appleton, to study the effects and possibilities of certain of the white pigments in paper.

This work is still in progress both at the Institute of Paper Chemistry and in the research laboratories of The New Jersey Zinc Company and this paper should be regarded as a progress report rather than the work of a finished investigation.

The entire group of zinc pigments showed promise of being ideal for use in the paper industry due to their high degree of whiteness, brightness, fineness, and uniformity of particle size, and to their high refractive index, which is necessary for good opacity. It was soon found, however, that zinc oxide had a rather limited use, due to its neutralizing effect on the alum which is commonly used in sizing paper. On the other hand, the series of zinc sulphide pigments were found to have no such action and to give many desirable characteristics when incorporated in paper. The zinc sulphide pigments which were intensively studied over the past year were:

Zinc Sulphide Pigment No. 20 (XX Zinc Sulphide).

Zinc Sulphide Pigment No. 19 (Trade name, Cryptone).

Zinc Sulphide Pigment No. 13 (Trade name, Albalith).

The difference in the three pigments studied consists chiefly in the amounts of the essential zinc sulphide component. Zinc Sulphide Pigment No. 13 (Albalith) contains from 28 to 30 per cent of zinc sulphide, the remainder being essentially precipitated barium sulphate or blanc fixe.

These two pigments are co-precipitated and processed together to form the final product. Pigment No. 19 (Cryptone) is similar to No. 13 except that it contains approximately equal weights of zinc sulphide and barium sulphate. Pigment No. 20 is commercial zinc sulphide and has been found most desirable when striking results are desired from a small addition of pigment. Zinc Sulphide Pigments No. 19 and No. 13 are slightly more economical and are preferred in cases where more pigment can be used.

Opacity Factors

The opacity which results from the incorporation of these high strength pigments in paper is due to the characteristic qualities of the zinc sulphide pigment. The first, and most important, property is the high refractive index, or the property of the pigment particle to bend back the light rays which strike it. The refractive index of zinc sulphide is 2.37, compared to paper, talc, calcium carbonate, gypsum, and most clays with indices ranging from 1.53 to 1.56. Refractive indices of materials commonly used in the paper industry are listed in the following table.

TABLE I—REFRACTIVE INDICES

Zinc sulphide	2.37
Zinc oxide	2.01
Barium sulphate	1.65
Clay (Kaolin)	1.56
Calcium carbonate	1.56
Talc	1.55
Paper (Cellulose)	1.53
Gypsum	1.53
Tung oil	1.52
Linseed oil	1.48
Paraffin	1.43

The second most important property which influences opacity is particle size. It has been found that as the particle size of a constant weight of pigment is decreased, its opacity increases until an exceedingly fine subdivision is reached. The optimum particle size for these high strength pigments is about .25 micron (or .00001 inch) and this size is obtained by careful control of the manufacturing process. Together with small and uniform particle size, the degree of dispersion is important. It is

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* Presented at the annual meeting of the American Pulp and Paper Mill Superintendents Association, Green Bay, Wis., June 8-10, 1933.

[1] Chief of the Fundamental Pigment Section, Research Division, The New Jersey Zinc Company, Palmerton, Pa.

obviously useless to produce pigments of small particle size, then to allow the small particles to coalesce into large aggregates, thus losing the effect of the tremendous number of pigment surfaces which are necessary to give the maximum reflection of light. Another way to produce opacity is to dull the color of the pigment. This produces absorption of light rather than its reflection. As it is desirable in most papers to brighten the sheet instead of dulling it, the property of refraction rather than absorption must be relied upon to produce opacity.

The whitening and brightening power of the pigment is dependent upon its uniformity of reflection of all visible light as well as refractive index. When incorporated in a paper the pigment not only causes the paper to be opaque but also tends to cover up any dull color of the fibers themselves. For instance, when used in a ground wood or unbleached sulphide sheet the immediate effect is to brighten and to whiten the resulting paper.

Sterilizing Action

One interesting property of the zinc sulphide pigments was discovered during the laboratory investigation and was later confirmed by results in commercial mills. This is their sterilizing action in a paper furnish. The original laboratory work was started at the Institute of Paper Chemistry last June. This showed that pulps of all the common kinds, in which zinc sulphide pigments had been incorporated remained sweet indefinitely. The original jars from these experiments are now a year old and show no evidence of decomposition or deterioration in those containing zinc sulphide pigments, whereas the control samples and those containing ordinary fillers deteriorated very rapidly during the warm summer months.

This laboratory work has been extended by J. A. Holderby, assistant sanitary engineer of the Wisconsin State Board of Health, who is working in conjunction with L. F. Warwick, the state sanitary engineer. Mr. Holderby concludes from his preliminary tests that it is quite clear that distinct benefits may be expected from the use of these pigments in paper stock and is of the opinion that further work is warranted to determine the minimum amounts necessary for reasonable protection.

In commercial plant operation it has several times been observed that at the beginning of the operation using these pigments the badly slimed equipment was completely cleaned within a few hours. The minimum amounts of pigment necessary for complete slime prevention are not known at present and are probably variable depending upon the pH value of the slurry, the type of slime infection and the temperature of the supply water. The solubility of zinc sulphide in water is known to be exceedingly small and has been reported as .0000065 grams per cc. The solubility in alum solution is greater but is still exceedingly small at pH values found in the paper industry. The action on accumulated slime growths in a paper mill is apparently dependent upon the concentration of a large amount of the pigment in the gelatinous mass. This permits the concentrated sterilizing action to be directed at the masses themselves and soon results in the disintegration and cleaning up of the accumulations. The sterilizing effects of other zinc compounds are well known. Most common is probably the use of zinc oxide ointment for skin disease. The preservative action of zinc sulphate in a glue or starch solutions is also well known. Zinc chloride has a similar effect.

All the advantages of the sterilizing effect of zinc sulphide pigments have not yet been thoroughly explored. One of the most obvious is the possibility of employing a completely closed white water system. Such a system would permit complete utilization of the paper pulp, pigments and other supplies entering the system. In industries employing waste paper, as for instance, the making of box board, bacterial growth is usually rapid. A zinc sulphide pigment can be used to produce not only a white outside layer to a box board but also can reduce, by means of the recirculating white water, the bacterial growth in the material entering the other layers. Although zinc sulphide pigments have a sterilizing action for bacteria it is non-toxic towards man.

In addition to freedom from slime spots, one mill has reported freedom from pitch accumulations when zinc sulphide was used. The action was apparently the coating of each pitch particle with pigment, thus preventing their coalescence and their adhesion to the Fourdrinier wire.

Effect of Pigment on Physical Properties of Paper

Extensive tests have been made on the physical properties of paper pigmented with zinc sulphide. The effect of this pigment on the strength of the paper was found to be surprisingly small. One reason is obviously due to the fact that the percentage of volume occupied is very small compared to the percentage by weight. Although the true specific gravity of the paper cellulose has been given as 1.50 the gravity of the finished paper itself varies from .5 to .8 depending upon the nature and processing of the paper. As the specific gravity of zinc sulphide is 4.0 a paper containing 10 per cent of pigment by weight will actually contain about 1½ per cent of pigment by volume. The pigment particles themselves have such exceedingly small particle size that they adhere to the sides of the fibers rather than interfering with the fibrillation which is so necessary for high strength. This small particle size does not cause cutting or crushing of the fibers during the drying and calendering operation.

In the large number of mills which employ stock cleaners of the centrifugal type, such as centrifiners or erkensators, it has been found that the pigment is not thrown out of the stock by these machines. This again is due to the uniformity and smallness of the particles as well as their adherence to the paper fibers. It is well known that coarse fillers are thrown out of the paper stock by these machines. However, when a machine of the centrifugal type is freshly cleaned and then builds up a pad of fibers it will select those fibres which are most heavily loaded, thus causing some loss of the pigment at the beginning of the run until this building up is complete.

The settling properties of zinc sulphide pigments can be readily controlled from one extreme state of complete dispersion, from which it takes a period of days to settle, to the other extreme state of flocculation in which case the settling is a matter of minutes. Even when acted upon by flocculating agents the pigment does not settle into hard aggregates but rather into soft flocs which are easily broken up by agitation.

Another property of paper containing zinc sulphide pigments is resistance to degradation. This property was determined by using the Bureau of Standards permanence test which consists of heating the samples in a constant temperature oven at 100 degrees for seventy-two hours. The treated samples were then tested for their physical qualities of fold, tear, mullen, and color and compared with the paper before ageing. The first sample tested was a bond composed of 50 per cent sulphite and 50 per cent rag. The unfilled bond lost 60 per cent of its folding index whereas the bond containing 3 per cent zinc sulphide pigment lost only 12 per cent. There was very little change in tear tests before and after ageing

but the mullen test showed a 10 per cent loss for the unfilled compared with the one per cent loss for the filled. This first indication led to investigation of a large number of filled and unfilled papers not only at the Institute of Paper Chemistry but also in several commercial laboratories. Although some exceptions have been found, results in general substantiate the conclusions from the first test. One exception has been papers of 100 per cent rag content. No appreciable improvement was noted in the filled rag papers as compared to the unfilled samples even when the ageing test was extended to 144 hours.

In addition to the permanence of physical strength properties the permanence of the white color of the treated papers is quite striking. Here again the hiding power of the white pigment operates to hide any yellow color generated in the paper fibers on ageing. The color of the zinc sulphide pigment is not affected by ageing nor by the acid gases (such as H_2S and SO_2) sometimes found in the atmosphere. Further work on the effect of these pigments on the permanence of paper is now being carried on.

Retention Factors

Anyone who has examined paper and pigment under the microscope would predict that the retention of the pigment particles in paper would be very low, as the interstices between the paper fibers are very large compared to the size of the pigment particles. However, laboratory tests indicated that the retention was satisfactory and depended more upon an absorptive action of the fibers for the pigment than upon mechanical filtering action. As a matter of fact, better retention was attained on one very fine particle size pigment than on another similar pigment with large particle size. Plant tests have confirmed the laboratory indications. Here, however, the retention figures are tremendously influenced by the following factors: the type of pulp, the degree of beating, the amount of recirculation of the white water, the freeness of the stock, the speed of the paper machine, the weight of the manufactured paper, the pH value of the stock and the operation of the save-alls.

The magnitude of these factors outweighs the influence of small changes in particle size of pigment. Under very adverse conditions retention figures around 30 per cent have been experienced. More favorable conditions result in 50 to 75 per cent retention and two mills which have a nearly completely closed white water system are obtaining 95 per cent retention of zinc sulphide pigment.

The incorporation of these pigments in the paper presents no fundamental operating difficulties. The pigment may be added dry or in slurry form to the beater and disperses within a few minutes throughout the stock.

Reaction With Copper

There is one precautionary measure that might be brought to the attention of a plant having considerable copper equipment. This is to avoid acid conditions so excessive as to attack this equipment, and to form a dilute copper solution. Such a condition can dull down the white pigment to an extent dependent upon the amount of copper in solution and the time available for the reaction. In such cases it is desirable to avoid pH values of the stock below 4.5 and preferably to maintain values above 5.0 It is interesting to note in this connection that the chemists of the United States Bureau of Standards are recommending similar pH values for United States Government finished papers to those we recommend for papers in process. Based on their findings, the United States Government specifies that much of its fine paper has a pH value not less than 5.0. Not only has this paper been found to be more permanent, but it is not so liable to contain copper, which can be discolored by the sulphurous gases always present in small quantities in the atmosphere.

Commercial Results

The following description of some typical commercial tests shows some results obtained by the use of zinc sulphide pigments.

1. Paper designed for a mail order catalog was pigmented with Zinc Sulphide Pigment No. 19. The resulting paper was whiter and brighter than the unfilled in spite of the addition of considerable dulling agent. The opacity of the lightly pigmented 19-pound paper was greater than that of the unpigmented 21-pound and the opacity of the more heavily pigmented 19-pound paper was equal to the 24-pound unpigmented paper.

2. The long time beating necessary in making a high grade all-rag bond hydrates the fibers to such an extent that the opacity of the paper is diminished. This is easily remedied by the incorporation of the high strength zinc sulphide pigment. The amount necessary to produce good opacity is insufficient to change the desirable physical characteristics on the paper such as the rattle, cockle, size, strength, or the general feel. In one test a 9-pound folio paper having an opacity of 51 was pigmented with about 6½ per cent of zinc sulphide which increased the opacity to 70,[2] which equals the normal opacity of a 16-pound folio. Another mill is making a 16-pound folio bond pigmented with from 5 to 6 per cent of Zinc Sulphide Pigment No. 19 and is obtaining an opacity equal to its unpigmented 24-pound bond.

3. When paper is impregnated with paraffin preparatory to its use as a bread wrap, the opacity of the paper is lost to a large extent. This is due in a large measure to the fact that the refractive index of paraffin is very close to that of the paper fibers so that the light passing through the paraffin sheet does not undergo refraction as it passes from the paraffin to the fibers themselves. If this paper is filled with talc, clay or other material having a refractive index around 1.5, no advantage is gained in the direction of higher opacity. However, if zinc sulphide is used, there still exists enough difference in refractive index between the paraffin and the pigment so that the resulting paper retains a large degree of opacity. It is for this reason that the manufacturer of opaque bread wrap must use a high strength pigment and has found the zinc sulphide pigments to be well suited for this use.

4. The benefit of these pigments in mimeograph paper has been found to be apparent not only in increased opacity of the paper itself, but in decreased "show through" from the mimeograph inks commonly employed. A pigmented sheet which apparently has only a slight advantage in opacity before printing shows such superior resistance to ink "show through" that it can often be satisfactorily mimeographed on both sides.

The preceding instances are mentioned as typical examples where zinc sulphide pigments can be used to advantage when incorporated directly into the paper, and were selected from the fifty-odd cases of commercial runs made during the past six months.

Mention should be made also of the value of these pigments as coating agents. In this field zinc oxide as well as the sulphide gives very satisfactory results. Due to their high hiding power, these pigments are especially valuable in the relatively thin coatings applied by the newer processes.

In conclusion, appreciation is expressed for the aid and cooperation of the staff of the Institute of Paper Chemistry, especially Dr. Otto Kress and Dr. Harry Lewis who have contributed largely to the success of this new development.

[2] Contrast ratio determined by Davis opacimeter.

The Lubrication of Ball and Roller Bearings and The Lubrication of Gear Reduction Sets *

By J. W. Stack[1] and A. Hutchinson[1]

This paper is divided into two subjects which are treated separately. The well established theories on the lubrication of anti-friction bearings and the theories on gear lubrication are so well established that they are touched upon but briefly here. The main purpose of this paper is to point out the importance of proper lubrication and the essentials a lubricant should possess.

Practically all of the instruction books and other engineering data issued by the manufacturers of ball or roller bearings, state that the reason for the lubrication of these bearings is, first, to protect the highly finished surfaces from rust or corrosion; and, second, to form a lubricating film between the rolling members and their cages or retainers. We may add to these requirements the sealing effect of greases and the dissipation of the frictional heat by the oil or grease.

A perfect ball bearing would have only point contact at its inner and outer races and, obviously, a lubricant at these points would only be a detriment, but since the metals are and must be elastic, the ball or roller and the races are subject to deformation when a load is applied to the bearing; this changing contact and the sliding action developed must be lubricated. On light loads or on high speeds it is believed a lubricant functions on the race. This, too, is claimed by the roller bearing manufacturers. With certain types of roller bearings having guiding flanges or thrust collars, lubrication at that point is a very essential factor.

From the foregoing it is obvious that in selecting the correct lubricant for any given bearings installation, we must consider, first, the physical properties required of the lubricant which are its lubricating value and its viscosity or fluidity, and these must be considered at the temperatures at which the bearing is to operate.

As the other major requirement is protection of the bearing surfaces against rust or corrosion, the chemical purity of the oil or grease and its stability or resistance to oxidation in service is a very important factor.

The question as to the best water resistant type is also of importance when considering greases.

In selecting the type or grade of lubricant best suited for any particular ball or roller bearing installation, the important factors, which are of a practical nature, are as follows:

1. The speed and the temperature at which they shall operate.
2. The method by which the lubricant is to be applied, or the type of lubricating system.
   (With this must be considered the type and effectiveness of the closure or shaft seal.)

High speed bearings (above 5000 r.p.m.) can use only light bodied oils. Slow speed bearings can best be served by heavy and extra heavy oils. A heavy or adhesive lubricant in a high speed bearing would result in considerable power lost in churning the lubricant and could not be depended upon to cover and lubricate the surfaces at the rate required, while a light oil in a slow, heavily loaded bearing would not provide sufficient protection of the surfaces to be lubricated.

3. The temperature in which the bearings are to operate.

This is another important factor. Since the viscosities of lubricating oils change at a uniform rate with changes in temperature, an oil must be chosen which will have the proper viscosity at the operating temperature of the bearing. The effect of temperature on greases is not so direct, although they do soften with increasing temperature up to their melting point, after which they must be considered as fluids.

The quality or purity of lubricants depreciate constantly with increases in temperature. Inferior oils or greases rapidly oxidize or gum and may eventually carbonize, making them unfit for use in a relatively short time.

Most Common Methods

The most common methods of lubricating anti-friction bearings are: wick feed, bath or splash, drop feed and circulating systems.

Wick feed lubricating systems are used in a variety of designs and are applied to very high speed machinery using the lightest spindle or turbine oils.

The bath or splash method is quite common for machines with widely separated bearings. The conventional design comprises a separate bearing housing with a fixed or automatic level. This type is often employed in connection with other mechanisms where one oil serves a number of purposes. This system should be provided with some approved form of gauge glass or means of indicating the oil level and adequate means of draining and cleaning.

Drop feeds or sight feed oil cups are often applied to bearings subject to light or medium service where a special oil is required, such a water soluble oil, or the sight feed cup is often added to a bath lubrication system to balance oil leakage through the seals.

The circulating system may be designed as a unit to serve two or three bearings; or the central system as applied to paper machinery, with adequate capacity and suitable means for controlling the oil temperature, sealed against leakage and provided with ample filtration—which is the best method from the standpoint of long bearing life.

With proper attention to the filters and regular inspection of the bearings, these systems are very dependable and economical on oil.

Grease lubricated bearings are sometimes equipped with a central or multi-feed system, and these are frequently applied where dirt or water conditions are particularly bad.

Ball and roller bearing engineers have spent a great deal of time and effort on the designs of bearing seals and have done some excellent work. Different types are recommended by them according to the service conditions. Very frequently, however, this important point is not given

* Presented at the annual meeting of the American Pulp and Paper Mill Superintendents Association, Green Bay, Wis., June 8-10, 1933.

[1] Lubricating Dept., Standard Oil Company (Indiana).

proper consideration by the mill mechanic when reassembling the bearing, with the result that water or dirt get into the bearing and cause considerable damage.

Mineral lubricating oils ranging in body or viscosity from 45 seconds at 100 deg. F. (for highest speed wick or spray lubricated bearings) to very heavy oils such as mineral cylinder oils with viscosities to 4000 seconds at 100 deg. F. (for slow speed or high temperature conditions) are recommended where oil is the desired lubricant.

With greases a much narrower range of products is used for the variety of anti-friction bearing conditions, although the type and viscosity of the oil used in the greases has a very decided influence on the torque reaction and the carrying capacity of the grease.

Cylinder oils or machine oils compounded with animal or vegetable oils are often recommended for lubrication of anti-friction bearings subjected to water or very humid conditions—for better protection of the bearings against rust.

The mineral oils suitable for ball and roller bearings should be of the best quality. They must, of course, be non-corrosive and free from resinous matter or gum. When used in circulating systems, particularly at high temperatures, the oil should have good stability or resistance to oxidation and should separate readily from water.

Oils of inferior quality may cause sludging or even gumming—with the possibility of considerable damage to the bearings. The cost of cleaning up a system where a poor grade of oil has caused one of these troubles will often far exceed the cost of one or more oil changes. Ball and roller bearings deserve only the best oils and these will be found the most economical in the long run.

Even when the highest quality oil is used in a circulating system that operated above 150 deg. F., the oil should be tested at regular intervals and the batch replaced by a charge of new, clean oil or sweetened by a goodly percentage of new oil—as the test of the oil in the system might indicate.

Advantages of Oils Over Greases

A high grade lubricating oil, selected with consideration of the foregoing factors involved in any anti-friction bearing installation, possesses the following advantages over greases:

1. The lowest torque reaction or power consumed in churning the lubricant.
   (This is particularly true of the higher speed bearings.)
2. When an oil circulating system is employed, the temperatures of the bearings can be held within close control.
3. There is less possibility of dirt or moisture getting into the bearing with this type of system.
4. Roller bearings with straight or tapered rollers, because of their larger surfaces and the necessity of thorough distribution of the lubricant over the entire bearing area, are lubricated much more satisfactorily with oil than with grease.
5. Oil lubricated bearings can easily be inspected and the lubricant completely changed, or the housing cleaned, when necessary.
   (If dirt or sand should get into the bearing housing, where properly designed, this will drop to the bottom and will not be suspended and passed through the bearing races, as would be the case with grease.)
6. Where suitable seals are incorporated in the design, oil lubrication is more economical as high grade oils are cheaper per unit volume than high grade greases.
7. Oxidation which occurs with either oil or grease has less harmful effect with oil and is at a much lower rate.

With the development during recent years of greases specially made for ball and roller bearing lubrication there is an increasing demand for this type of lubricant, and a ball or roller bearing grease possesses certain advantages which are extending its application for special conditions, particularly in the smaller sizes. For inaccessible bearings or bearings that are not provided with expensive seals, or bearings operating in very dirty conditions in the presence of considerable dust or water, greases possess some advantages over oils.

The kind and the amount of grease used in an anti-friction bearing is extremely important. The instructions of the bearing manufacturer quite generally state that the bearing should not be filled more than a third or one-half its capacity. This, however, is very difficult to follow for the bearing cannot be seen and there is always the tendency to fill a housing too full, which results in high bearing temperature, a waste of grease, and a contamination of parts by a dirty condition around the bearing.

It has been found advisable by some users of anti-friction bearings to provide no method of applying grease, such as a grease plug, grease cup, or pressure fitting. This necessitates the removal of the end plate to examine both the bearing and the quantity and condition of the grease. Since a properly designed bearing housing with a good seal can operate for six months or a year without attention, for some industries this method is quite practical and has been found to be the best; however, there are only a few such installations, and from experience we know that the best method of applying grease is by a grease cup, for by this method a measured quantity of grease can be applied at proper intervals. With the use of pressure fittings for application with a gun, the natural tendency is always to overlubricate, for one never knows how much grease is in the bearing until it begins to come out of the seal. After the bearing is started it will, of course, overheat, due to the churning of the entire mass of grease, and with the temperature rise and the air that will be beat into the grease, it will expand considerably in volume and leak for a considerable length of time. This feature is particularly troublesome with electric motors.

There are ball or roller bearings that are operated in particularly wet conditions or very dusty conditions, and when the speed is not too high, an excess of grease may be used to advantage, because in such cases it will reestablish the grease seal and crowd out the dust or water.

Kinds of Greases

Although greases can be made from a variety of stocks and oils or soap bases, either free or combined with solid lubricants such as graphite, mica, or clay, there are two general types recommended for anti-friction bearings and they can be classified as calcium or lime soap greases and soda or sodium greases.

Lime soap greases are generally applied where wet or water conditions prevail. Those greases are insoluble in water and when proper grades of this type of grease are used at normal or low temperatures, they give excellent results. They are generally smooth and easy to apply, do not lose consistency, or, in other words, break down or thin out from working.

Sodium greases, in general, are more popular for high speed ball bearing lubrication and for temperatures above 150 degrees F. They range in melting point from 350 to 450 degrees F.; they do not have the tendency to separate oil from the soap as readily as the lime soap greases

at the higher temperatures; and they are less susceptible to oxidation and hardening of the grease in the bearings. They are, however, hygroscopic, that is, they absorb and mix with water very readily and would wash out of a bearing in the presence of considerable water.

Anti-friction bearing greases, whether of the calcium base or the sodium base, should be entirely free of solid lubricants, graphite, mica, lead oxide, zinc, etc. These solids, it has been demonstrated many times, are injurious to the high finish of anti-friction bearings; they have a decided tendency to separate out of the grease because of the centrifugal forces, and the fact that greases soften in the race often results in these solids packing on one of the raceways, even to the point where they imbed into the steel which, of course, destroys the bearings.

Ball or roller bearing greases should be comparatively stable against oxidation or separation of the oil. This is particularly important in bearings that might be idle for long periods or in storage. Separation of the soap in greases is responsible for a good many bearing failures. It is not uncommon to see ball or roller bearings practically frozen because of the accumulation of the soap particles around the balls or rollers due to oxidation or separation of the oil from the soap.

Ropy or very fibrous soda greases are to be avoided for such greases may ball up in the bearing, leaving the rolling members and the races entirely dry and unlubricated. A ball or roller bearing grease should change little in density from working, or, in other words, should not soften or thin out to the point where it will be thrown out of the bearing, although some manufacturers desire a comparatively stiff grease which will soften in and around the raceway and the stiffer or undisturbed portion form a seal at the shaft ends. Great care is exercised in the manufacture and development of anti-friction bearing greases. The type of oil used in the manufacture of the grease must be of the same high quality as the oil specified for oil lubricated bearings. The grade of oil used in the manufacture of a grease has a very decided effect upon the torque reaction of the grease, particularly at low temperatures, and the stability of the grease at high temperatures—although greases and the oils in the greases are not required in as wide a range as in the case in oil lubricated anti-friction bearings.

One of the most common difficulties experienced with the use of grease in ball or roller bearings is the dirt and grit that gets into the open container or grease or into the gun used on high pressure fittings. It is not often appreciated that a particle of such abrasive material will stay suspended in grease and is very likely to find its way between the rolling members. Suitable packages should be provided for this service.

Anti-friction bearings are used under a great variety of conditions which cannot be covered by this brief paper. For any special application it is advisable to consult with the lubrication engineer of your oil supplier. All of the recognized oil refiners maintain a staff of engineers, specialists in their line, who are ready at all times to assist in these problems.

The Lubrication of Reduction Gears

Reduction gear sets or gear reducers have played an important part in the evolution and development of the paper industry machines. From the slow speed open type gears, which were lubricated with waste products, (if lubricated at all) to the modern, fully enclosed high speed gear reducing sets, capable of high duty and a high efficiency—has been but a natural trend or evolution for higher and better production at lower cost.

The general type of gears employed in the paper industry are the spur gear, the helical, herringbone, spiral bevel, and mitre gears. From the standpoint of the lubrication factors involved, the worm gear and the hypoid gear are to be treated apart.

In pure theory, a perfectly designed gear should involve rolling motion only, and the friction resulting from the operation of such a gear would be that developed from contact and deformation of the metal. It is, of course, practically impossible to attain this idea of design. Regardless of the accuracy in the cutting of the gear teeth or the form or type of the teeth, a certain amount of sliding motion will be present and sliding motion is responsible for most of the friction and wear on gear teeth. As this wear increases, the rolling motion desired will be finally supplemented entirely by the sliding motion.

Whatever the nature of the friction involved, it will depend to a very large extent on the alignment of the matching gears, the accuracy with which the gear tooth is formed, and the freedom of movement with which the gear teeth engage or mesh. Obviously, the most efficient gear set will allow a free, smooth rolling of the gears in relation to each other, with a constant relation in velocity between the respective tooth surfaces, so that the friction and vibration will be reduced to a minimum.

The gear in most common use is the spur gear because it lends itself readily to a variety of machines in different arrangements and positions. This type is most commonly used for medium tooth loads and average speeds. For lubrication consideration, they can be classified into two general types—"open gears" and "enclosed gears." Where the nature of the work will permit, open gears are generally lubricated by periodical swabbing with heavy gear compound or the plastic types of gear greases which are generally mixed with graphite, mica, or some other forms of solid lubricant. The heavy and highly adhesive gear compounds, which should be heated before application, generally give the greatest degree of lubrication and protection of the gear teeth particularly on the slow speed, heavy duty work, and because of their highly adhesive properties they resist the centrifugal force which tends to throw the lubricant free of the gears. The plastic type of gear greases are popular for application only because the compounds can not be conveniently applied. Although the development and improvement of oil-tight gear cases have very materially simplified the problem of gear lubrication and have been responsible for the great economy in the cost of their lubrication, there is a correct oil for each operating condition. The factors involved in the selection of the right lubricant for this type of gear are, first, the correct body or viscosity—after due consideration has been given to the type of service and the effect of surrounding or air temperatures and the effect of internal friction, or the heat developed from the churning of the oil. Most of these gear sets use but one oil for the lubrication of gears and bearing. The type of bearing in the gear set is an important factor in the selection of a lubricant as, for instance, where the gear set is in connection with a steam turbine the one oil must lubricate the high speed bearings of the turbine and the bearings on the reduction gear, as well as the gear teeth themselves. In some instances it might be desirable to use a relatively heavy bodied oil in the gear bath; yet, this oil would be too heavy to properly lubricate the sleeve bearings of the gear set. This problem is not present where anti-friction bearings are used as they will operate quite successfully on heavy types of gear oils. (Large heavy duty gear sets with sleeve bearings are frequently provided with a separate oiling system for the bearings.)

Where the surrounding or air temperature is relatively high, heavier bodied oils must be used because the factor of operating viscosity—or the viscosity of the lubricant at the operating temperature—will be reduced.

Where the service is of intermittent character or the gears are subjected to considerable impact, starting and stopping, or overloads—the heavy bodied oil between the gear teeth will eliminate or modify the shock and minimize the noise.

The helical and herringbone gears are very commonly applied to heavy duty and high speed work. This type of gear is generally equipped with some form of force feed or oil spray lubrication. The same factors are involved in the selection of the proper oil for this gear as for those in the straight tooth or spur gear.

Bevel gears are generally considered to involve in their operation somewhat more sliding motion than is the case with spur or herringbone gears, and for this reason heavier lubricants are generally applied to compensate for the wiping effect on this type of gear.

There are two general methods of lubricating these forms of reduction gear sets—bath lubrication and spray lubrication.

In the bath method, which is sometimes called the "splash" method, a quantity of gear oil is put into the gear case to a predetermined level. The gear will pick up oil and carry it to the point of meshing and a part of the oil will splash or be directed by pipes or troughs to the bearings. This method is very satisfactory for low and medium speeds. The oil best suited for this type are the heavy or extra heavy turbine oils, or heavy grades of gear oils. Obviously, the depth of the oil bath has a considerable effect on the frictional resistance of the gear passing through it. At high speeds the windage of the gears may prevent the carrying of oil to the point of mesh resulting, of course, in extreme noise and, finally destruction of the gear teeth because of the absence of any lubricant.

For the high speed gear sets, the oil spray or flooded form of lubrication is the most efficient. The spray system may be of the unit or self-contained type, or from a central supply system to a number of gear sets. Lighter gear oils can be used with this method.

Whether the oil selected for any given gear set be of the extra heavy viscous type or the comparatively light oil used in turbine reduction gears, it pays to use only the highest quality oils for this service. Highly refined oils can be used longer and without deterioration or the formation of sludges and gummy deposits, and prolong the life of the gears.

The worm gear is used to a large extent as a speed reducing unit where right angle high ratios are required and smooth operation is desirable. Although the open type of worm gear is still in use to a limited extent, the enclosed bath lubricated unit has rapidly replaced it in the industry. This type of gear involves sliding motion entirely and presents a somewhat different problem in lubrication than the other types of gears already discussed.

Because the unit pressures and the rubbing velocity of the worm and worm gear are relatively of a high order, only the very best grades of extra heavy lubricating oils or cylinder stocks—compounded with a small amount of selected animal oil or fat— are generally found to give the best results. No other combination, with the possible exception of the hypoid gear, is more dependent upon the correct lubrication for proper operation than is the worm gear, for with an improper lubricant in such a unit the expectant life of the gear can be greatly shortened, and often such a gear can be damaged beyond repair in a short time after operating with an inferior lubricant. When operating continuously at full load, a worm gear set should operate at a temperature not more than 100° F. above the room temperature. When the oil temperature in a worm gear case goes up higher than this, it is direct evidence that the set is overloaded and that the lubricant is or has become too heavy or is of poor quality.

For bath lubricated worm gear reduction sets, the correct oil level is very important. In general, for the submerged worm or where the worm is below the worm gear, the oil level is carried to about the center of the worm shaft. Where the worm is above the worm gear, a heavier lubricant—carried at a slightly higher level—is the rule.

Frequent inspection of the oil level and the condition of the oil is recommended. Often the first signs of trouble found in the oil in a new gear set will be finely divided bronze in the oil. This condition generally disappears after the gears have set; however, if it continues, an immediate search for the cause should be instituted. When the worm gear oil becomes too heavy or traces of sludge or carbon are found, the oil should be changed after complete flushing of the case and an examination has been made of the gears, the bearings, and the packing.

With recent years one of the oustanding developments in gear drives for the pulp and paper industry has been the use of the hypoid gear. In general outward appearance, the hypoid gear resembles the spiral bevel gear and in addition other advantages due to offset. Being an intermediate type, hypoid gears combine with the smooth rolling action of the spiral bevel gear some of the smooth sliding action of the worm gear. The amount of endwise sliding between the teeth of hypoids so far used is only about one-fourth the amount which occurs in a worm drive with a 45 deg. helix angle. A special type of lubricant with high film strength is required for the proper lubrication of the hypoid gear.

The oil industry, in cooperation with the gear manufacturers, has developed lubricants capable of sustaining extreme loads for the lubrication of these gears. These lubricants are called "E. P. lubricants"—an abbreviation for extreme pressure. They are the only lubricants that should be used on hypoid gears in any class of service. With normal oils there is great probability of scoring or galling of the gear teeth on a hypoid gear set fully loaded.

Extreme Pressure Lubricants

Extreme pressure, or E. P. lubricants, which are made for hypoid gear service, can be divided into three general classes:

Sulphurized oils or greases.
Lead or zinc soap lubricants.
Oils or greases containing chlorides.

Extreme pressure lubricants should, of course, be used only for the loads of extreme magnitude for they have no superiority over conventional lubricants on normal work; in fact, under such conditions they might show somewhat greater wear than conventional oils or greases. Their greatest effectiveness is on steel to steel bearings or gear teeth; however, many cases have been recorded where E. P. lubricants have demonstrated superiority on worm gears, particularly in automotive work where hardened steel worms and a hard aluminum bronze worm gear were used, but these have been the exceptions.

As extreme pressure lubricants are of rather recent development, considerable confusion may exist in the mind of the mill operator as to the selection of the best type. Many extravagant claims are often made as to the film strength or load carrying capacity of some of these products—claims far beyond the ability of any steel. It is therefore best to consider only those products recom-

mended by the manufacturer of the machine and those made by a refiner with facilities and experience that can be depended upon.

The essential points to consider in the selection of an E. P. lubricant are:

1—STABILITY

The lubricant should maintain its E. P. properties for years of service in the gear case, without separation or loss of the active ingredient.

2—ABRASIVENESS

By nature E. P. products have been proven to be slightly abrasive as compared to conventional oils or greases. This effect is very mild in a well made product—which has been conclusively proven by both laboratory and practical observations.

In many cases it is possible to replace the E. P. lubricant with a normal one after the gears have been run in on load. This would indicate a lapping or polishing action has taken place and the load on the gear tooth better distributed, permitting the use of a normal oil.

The principal materials used in the past to secure E. P. properties have been lead, soap, sulphur and chlorides.

The metallic soaps in any effective quantity are very difficult to hold in suspension in an oil under any condition, and when they do separate from an E. P. lubricant the soaps are very apt to clog the oil grooves in sleeve bearings or destroy anti-friction bearings used in connection with the gears.

Examination of the lead or zinc soap types of E. P. lubricants reveals the fact that those that pass required E. P. tests also contain appreciable amounts of sulphur.

Another type of E. P. lubricant is the chloronated oil, with or without the addition of sulphur. This group has good E. P. properties but due to the unstable nature of the chlorides they frequently fall off in the E. P. properties, especially at elevated temperatures.

The sulphurized E. P. lubricants do not depreciate in use as they do not lose their effective ingredients by separation or evaporation. They are free from corrosion troubles and when made from a good quality base oil they will not thicken or gum due to oxidation.

It has been a general rule among gear engineers, when pitting or scaling showed up on the pitch line of the gears, to apply heavier oils or compounds to the lubrication system—this condition generally the result of very high unit pressure on the tooth due to overloads, impacts, or misalignments. If the pitting is in small areas and the pits are small, this remedy often proved successful, mainly (perhaps) because the heavy adhesive product modified the impact and vibration. As a general rule, however, when pitting or scaling of the tooth faces is of any magnitude, this fatigue failure of the metal cannot be eliminated by the use of heavy gear lubricants—even including the E. P. products. In the mild cases of pitting and in all cases of scoring or galling of any steel gear tooth, the E. P. oils will be effective, and lighter bodied E. P. oils can be used instead of the very heavy adhesive oils and compounds, reducing the temperature developed from fluid friction and making it possible to use the one oil for both gears and bearings.

It is a very good policy to establish regular inspection periods for all gear sets, draining the oil at least once a year, examining gears and bearings, and cleaning the gear case of dirt and sludge. If the oil is in good condition after filtration, it can be put back into the gear case and this practice can be repeated for a number of years. Where extra heavy oils are used, because they are so difficult to clean up it is advisable to use them for other purposes, refilling with new oil.

The Windowless Paper Mill*

By A. E. Montgomery[1]

When, in the fall of 1930, Blandin Paper Co., at Grand Rapids, Minn., designed and started construction on an addition to their paper mill, they used a type of construction never before attempted in paper mill work. For the first time a paper machine room, basement, and finishing room were built purposely without a window, skylight, or any other means for admitting outside light.

True, a windowless construction was not entirely without precedent, but to extend this type of construction into a paper mill constituted a step which should be of more than passing interest to paper makers.

General Appliance

The new construction comprises an addition to an existing two-machine mill. A new finishing room building and train shed were built on to the old finishing room and connecting to the new machine room and machine room basement. This finishing room building is 128 feet long by 80 feet wide, exclusive of train shed, and is built with basement, mezzanine and main floors, affording space for finishing, storage, shops, and store room.

The new machine room and machine room basement are approximately 320 feet long by 50 feet wide, and are built to house one machine. Walls are of hollow tile and brick veneer, and roof is of wood. The 156 inch machine, trimming 144 inches, embodies the latest developments in a high-speed paper machine. Of interest is the fact that the 40 x 60 inch driers are driven with a fully enclosed chain drive, making the back side of the machine as open for spearing broke as is the front side, and giving unusual quietness.

From the outside of the mill the appearance is at once arresting and attractive. The walls do not give the blank appearance such as is seen in windowless walls built with the thought of future extension. Instead, the walls are paneled artistically with brick of several colors in a design which is architecturally most pleasing.

Striking as the exterior may be, the effect inside is even more surprising to one who is familiar with the usual paper mill. The lighting is entirely by means of mercury vapor lamps, casting a weird light, which at first seems to have a bluish-green hue. Looking down into the old machine room, which is still lighted with incandescent lamps, the lighting there seems orange by comparison.

Reasons For Windowless Construction

The first thought, of course, is to ask, "Why use the windowless construction?" There are really two primary reasons, the first having to do with lighting, the second with ventilation.

Taken the year around the outside light is helpful in

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lighting the ordinary mill only about twelve hours out of the twenty-four, and during a considerable portion of these daylight hours electric lights are required to supplement the amount of light entering through windows or monitors. This daylight varies almost continually, hour to hour, or perhaps even from one minute to the next, and the lighting varies from wholly artificial light to complete daylight. Does it not seem reasonable to suppose that a lighting absolutely uniform day and night, summer and winter, would be advantageous? Such a result obviously can be obtained only if the varying outside light is entirely excluded.

The second reason for the windowless construction involves ventilation. The maximum uniformity of temperature, air movement and ventilation, can be obtained only if the air is handled at all times in the same manner. Temperatures certainly are subject to considerably less variation where sun cannot bring its heat through windows or skylights, where the high heat transmission through glass is non-existent, and where unsteady drafts from open windows or ventilators are eliminated. The windowless construction best meets this requirement.

An incidental advantage lies in the elimination of all window maintenance. No cleaning is required nor are there storm windows to be taken off in the spring and replaced in the fall.

All lighting in the new portion of the mill as well as the old finishing room is accomplished with General Electric Cooper-Hewitt units having Uviol tubes which afford a certain amount of ultra-violet. In the machine room these tubular units are arranged in two rows, placed directly up under the trusses, stretching along the length of the machine room, one row near the wall on the front side of the machine and the other on the back. The most striking thing about this light is that there seems to be no shadows anywhere, whether it be up in the roof trusses or in between the dryers. The lighting effect is subdued but very effective and comfortable.

Colors containing red are not given their true values, hence the light is not suitable for matching colors. Shades, however, may be matched successfully. Of the lights which have been in service since early in 1931, less than 25 per cent have needed replacements. From this it seems reasonable to expect 12,000 hours as an average life for each tube, although this is somewhat longer than the usual expectation due to continuous burning hours. One Cooper-Hewitt unit takes the place of four 250-watt incandescent lamps, hence the cost of replacement would seem to be practically the same as for incandescent lamps. The cost for power on the other hand is only about one-half that for incandescent lamps. Over two years' experience with this type of lighting by the Blandin Paper Co. leaves them thoroughly convinced of their preference for it.

In every paper machine room, of whatever design or construction, air of sufficient volume to carry away evaporated moisture from the sheet must be admitted from outdoors at the outdoor temperature, and at some one or more places heated finally from the outdoor temperature to the temperature at which it leaves the machine room. The heat requirement is the same whether this air comes in by infiltration and is heated at several different points, or whether it is all brought in at one point.

At the Blandin Paper Co. it was decided to view the problem rationally, and winter and summer to deliver through the ventilation ducts a constant and controllable volume of supply air approximately equivalent in volume to that which must be exhausted from above the paper machine.

The machine dryers are provided with a well designed hood of Transite and steel construction with adequate overhang to provide easy access to every part of the dryer section. Four exhaust stacks rise vertically up through the roof with slip joints in each for passage of the crane. These slip joints, by the way, are easily raised and lowered from the floor level. At the top of each exhaust stack, in a fan room located on the roof, is a Multivane type exhaust fan. Three of these discharge through Brine Economizer heat recovery units, while the fourth, for the present, discharges directly to the outside, provision being made for later Briner Economizer installation to heat beater room and grinder room portions of the mill.

Of the heated air from the Briner units approximately one-third is supplied to the roof of the new machine room, one-quarter to the ends of the machine room basement where it in turn finds its way to the felt drying supply system, one-quarter to the three floors of the new finishing room building, and the balance of about one-sixth is delivered to the wet end five bays of the old machine room.

The supply volume amounts to approximately 123,000 cubic feet of air per minute measured at 70 degrees F. An interesting digression at this point might be made to indicate in a more convincing manner the importance of proper consideration being given the ventilation problem. Thirteen and one-half cubic feet of air weigh one pound. It may, therefore, be pointed out that 123,000 cubic feet of air per minute is equivalent to 9,100 pounds of air per minute, or approximately 4½ tons per minute. This in turn is 270 tons of air per hour, or 6,500 tons in 24 hours, which must be handled through this Blandin machine room to take care of one machine. Assuming a nominal production of 100 tons news print per day (the machine is capable of producing more than this) gives us the interesting figure of 65 tons of air which must be handled through the machine room for every ton of paper made. In many machine rooms this figure exceeds 75 tons.

This leads naturally to the consideration which was given at Blandin Paper Co. to the problem of heat recovery whereby Briner Economizers were used to recover a portion of the heat in the exhaust vapors for heating the incoming supply of air.

Some interesting figures based on tests at the mill indicate that heating approximately 123,000 c.f.m. from the heat in three-fourths of the exhaust gives the following heat recoveries: At 40 degrees there is recovered heat equivalent to 6,500 pounds steam per hour, which is 190 boiler horsepower, and which at 25 cents per thousand pounds for steam amounts to $970 per month. With 0 deg. F. outside the heat recovery is at the rate of 11,000 pounds steam per hour, or roughly one-third that used in the paper machine driers, and this is equivalent to 310 boiler horsepower, or at 25 cents per thousand pounds is a saving at the rate of $1,600 per month.

The windowless construction enables this machine room to be heated and ventilated satisfactorily with an unusually low supply air temperature. Except in the most extremely cold weather all heating in the new paper machine room, paper machine room basement, old finishing room, the three floors of the new finishing room, and a portion of the wet end of the old machine room is accomplished entirely with heat recovered from the Briner-Economizers, no steam whatever being used. Another interesting result of the windowless construction is that the temperature within the mill does not change materially over the week end shutdown, and for the same reason does not change with outside temperature conditions as rapidly as in the ordinary mill.

Windows serve only the two purposes of admitting outside light and admitting outside air. If light and air can better be supplied without windows no need exists for them.

Influence and Sulphidity on the Physical and Chemical Characteristics of Kraft Pulp*

By Otto Kress[1] and George H. McGregor[2]

Possibly no individual pulping process has received as much consideration as the manufacture of kraft pulp. The fact that it is one of the most extensive pulping procedures, and the complexity of the process involved, justly warrant the thorough painstaking consideration it has received. A cursory examination of the more popular trade journals and reference works clearly indicate the vast amount of information available and the multiplicity of variables involved in this great process. Undoubtedly, the research files of practically every kraft pulping technical department contains pertinent information, either relative to the general knowledge of kraft pulping some one or more phase of the process in which the particular plant might be interested, and which the operators feel should be limited to their own organization.

Among the many phases of the kraft pulping process is that pertaining to sulphidity or ratio of caustic soda to sodium sulphide. As is well known, the substitution of a portion of the total alkali by means of sodium sulphide tends materially to aid the digestive process by shortening the time of the cook or allowing the procedure to be carried out at a lower temperature, with the subsequent result of a slightly higher yield of acceptable pulp. The most generally accepted theory as to the function of the sodium sulphide is that the sulphide inhibits somewhat the initial action of the caustic alkali on the cellulose, for it has been shown that at the beginning of the cook the cellulose is attacked to as great an extent as the lignin.

In this paper we wish to present the results obtained under a given set of conditions by cooking spruce chips. In the work we have tried to assemble data that might be of interest to those men responsible for the daily production of alkaline pulp.

Experimental Procedures and Results

All cooks were carried out under similar conditions of time, temperature, total alkali and unit weight of alkali, the only variable being the ratio of caustic soda to sodium sulphide. For the cooking operation we used experimental steel autoclaves of two cubic feet capacity, rotating on steel tires similar to a rotary incinerator and heated indirectly by means of a row of gas burner flames impinging on the outer surface of the shell. All cooks were brought up to temperature in 45 minutes, and all but three had a total cooking cycle of 3 hours. The total alkali was equivalent to 20 pounds per 100 pounds of bone dry wood and the liquid volume was 30 gallons per 100 pounds of wood. The digesters were intermittently rotated throughout the duration of the cook, the fictitious pressure due to non-condensible gases being relieved at given intervals. At the conclusion of the cook, the pressure was relieved in about 2 minutes and the softened chips washed directly in the digester, after which they were removed and the yield of screenings and pulp determined by washing the pulp through a perforated steel plate.

The treatment of the pulp consisted of ascertaining bleachability and physical and chemical characteristics of both the bleached and unbleached pulp. Bleachability tests were determined by a standard permanganate test used at the Institute of Paper Chemistry. The pulp was bleached by the single stage hypochlorite method under given conditions of temperature and consistence and also by the double stage, chlorine-hypochlorite method.

The results obtained by pulping, bleaching and determination of physical and chemical characteristics are completely recorded in Tables I to IV.

Pulping Experiment

In Table I we give the condition of pulping and the yield of pulp and screenings. A survey of this Table indicates that in general, increase in sulphidity shows an increase in total yield. A ratio of two parts of caustic to one of sulphide gives a slight increase in pulp yield. At a ratio of three parts of caustic to two of sulphide the yield of screenings increases materially and the pulp slightly darkens. At a ratio of two parts of caustic to three parts of sulphide, the pulp obtained was very dark and very raw, considerably large amounts of incompletely cooked chips remaining. Obviously a ratio of one part caustic to three parts sulphide yields little or no pulp. Even increasing the time to six hours fails to yield an even fairly good pulp. Cooking with sodium sulphide alone fails completely to loosen up the chips. They become, in fact, blacker as the cooking time increases. From the results under these conditions, it is apparent that a small ratio of sulphide materially aids in the production of a well cooked alkaline pulp that is somewhat easier to bleach than the straight soda cook; on the other hand, substitution of total alkali by sodium sulphide is limited to fairly narrow limits if one expects to obtain a good yield of acceptable pulp.

Bleaching Experiments

In Table II we note the results of a bleachability test and shrinkage of pulp upon bleaching by the single stage calcium hypochlorite method and the double stage chlorine-hypochloride method.

The bleachability test clearly indicates incomplete cooking with increasing sulphidity, showing poor removal of incrusting material. It is also evident that slight substitu-

TABLE I—PULP YIELD

Cook Number	Chemicals: Lbs. B.D. per 100 NaOH	Chemicals: B.D. Wood Na_2S	Cooking Conditions: Pressure Lbs.	Cooking Conditions: Temp. C.	Cooking Conditions: Time at Temp.	Cooking Conditions: Hours Total	Yield: Pulp	Yield: Screenings	Yield: Total
1	20	..	115	175	2¼	3	42.1	3.1	45.2
2	13⅓	6⅔	115	175	2¼	3	42.7	3.3	46.0
3	12	8	115	175	2¼	3	42.7	5.6	48.3
4	8	12	115	175	2¼	3	38.2	14.3	52.5
5	6⅔	13⅓	115	175	2¼	3	35.3	21.4	56.7
6	6⅔	13⅓	115	175	3¼	4	36.0	19.7	55.7
7	6⅔	13⅓	115	175	5¼	6	36.5	15.7	52.2
8	..	20	115	175	2¼	3	0	...	83.3
9	..	20	115	175	5¼	6	0	...	80.7

* Presented at the annual meeting of the American Pulp and Paper Mill Superintendents Association, Green Bay, Wis., June 8-10, 1933.

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TABLE II—BLEACHABILITY AND SHRINKAGE

Cook Number	Bleachability Test Per cent Cl	Per cent Cl Necessary for White Color	Per Cent Shrinkage: Single Stage Ca Hypochlorite	Per Cent Shrinkage: Double Stage: 50 Per cent of Test as Cl	Per Cent Shrinkage: Double Stage: 50 Per cent of Test Ca Hypochlorite
1	14.99	14.99	2.91	6.62	3.1
2	12.28	12.28	3.89	5.00	2.8
3	13.62	13.62	4.60	7.50	1.15
4	15.23	19.04	3.57	7.66	1.15
5	15.75	22.83	3.76	7.10	1.42
6	16.14	25.50	4.46	7.32	1.12
7	16.08	26.53	4.86	6.75	2.80

tion of total alkali by sodium sulphide materially decreases the bleach consumption, a fact that is generally accepted.

In comparing the bleachability test and the actual bleach required to obtain a standard white we note a serious discrepancy. Such variance can be compensated for by the knowledge that all bleachability tests, depending on oxidation reactions, are restricted to somewhat narrow limits of impurities in pulps. A high bleachability test by any method other than an actual bleach test using calcium hypochlorite solutions, is not generally accepted as a positive indication of the actual amount of chlorine that would be consumed by a very raw pulp in order to obtain a standard white. It is quite evident that the very raw pulps require considerably more calcium hypochlorite bleach than the bleachability test indicates. In fact, it was impossible to secure a good white from the extremely raw pulps without destroying almost completely the physical qualities of the pulps. The extent of purification by means of bleach solutions then seems to be limited by the qualities of the pulp desired.

In Table II we also find shrinkage due to two methods of bleaching. The purification reaction due to calcium hypochlorite alone is obviously incomplete as shown by the very low shrinkage values. In the first stage, or chlorination stage, of the two stage reactions, considerable purification has taken place with the formation of soluble chlorlignin compounds. Further purification in the second stage by hypochlorite bleach gives low shrinkage values.

Physical Testing of Pulp

In Table III we have listed the physical qualities of the pulps produced at varying sulphitities. Continuous beating tests were made on the unbleached, single stage bleached and double stage bleached pulps. Freeness, tear and fold were recorded at the maximum strength. All tests were made in standard form on sheets duly seasoned at constant temperature and constant humidity. Survey of Table III shows the strength in general to increase with increasing sulphidity. Of course, a longer time is required to obtain the maximum strength in the case of the rawer pulps. It can also be noted that in the case of well cooked pulps such as Cooks I, II and III, the unbleached pulp develops the highest strength, the single stage bleached pulp being somewhat weaker and the double stage pulp considerably weaker. In the case of the raw pulp, on the other hand, the single staged bleached pulp appears to develop the greatest strength. In the purification of the unbleached pulps by means of various methods of bleaching, the bleaching action, apparently, although complete, is so drastic that we sacrifice the physical qualities of the pulp to obtain a good color. The sheets made from the raw pulps were very dark in color, developing strength very slowly and possessing a rather harsh feel.

TABLE III—PHYSICAL TESTS ON PULP

Cook No.	Maximum Bursting Strength-Time: Unbl.	Time	Single Stage Bleach	Time	Double Stage Bleach	Time	Freeness at Maximum: Unbl.	Single Stage Bleach	Double Stage Bleach	Tear at Maximum: Unbl.	Single Stage Bleach	Double Stage Bleach	Fold at Maximum: Unbl.	Single Stage Bleach	Double Stage Bleach
1	112	75	106	45	96	30	250	480	400	122	98	67	670	540	397
2	165	90	138	60	83	30	270	330	380	135	68	45	1170	604	...
3	167	90	154	60	89	30	320	340	420	133	69	46	1500	598	143
4	165	105	182	75	164	45	380	540	600	124	73	80	1420	811	381
5	166	105	199	75	147	60	450	460	440	125	86	80	1380	1270	467
6	157	90	181	90	159	60	470	460	340	125	103	71	1470	1093	459
7	152	90	173	75	170	75	430	450	540	123	106	95	960	838	605

A—Freeness

The rawer pulps at the maximum strength appear to possess greater freeness than the softer and better cooked pulps. All freeness tests were made on the Schopper-Reigler freeness tester. In general, in the case of the well-cooked pulps the freeness at maximum strength was greater with the bleached than with the unbleached pulps. The freeness of the incompletely cooked bleached and unbleached pulps is quite similar.

B—Tear

The tear test, made on the Elmendorf tester under standard conditions, shows marked increase with increased sulphidity. We note also the highest tear test developed by the unbleached pulps, the two stage bleached pulps apparently developing the lowest tear test. Again we have sacrificed physical quality for drastic purification by bleaching.

C—Fold

The fold developed at maximum strength seems to parallel the trend followed by the tear test. As we increase sulphidity with consequent production of rawer pulp the fold developed at maximum strength decreases. It is evident that we lose considerable of our folding quality in purification by means of single and double stage bleaching. The double stage bleached pulps develop the lowest fold test at the maximum bursting strength.

Chemical Testing of Pulp

In Table IV we have assembled a few chemical tests applied to the various pulps. In general, we might say, that the chemical tests permit little, if any, conclusions to be drawn as to the physical qualities that might be developed by the pulps.

A-Cellulose

The a-cellulose test, as such, varies only slightly with increasing sulphidity. It is quite apparent that bleaching of the pulps causes lower a-cellulose contents. Degradation of the cellulose and incomplete washing of the bleach residues serve to give a low a-content. In the case of double stage bleached pulps, the bleaching was so drastic in order to secure a standard white that the cellulose had only very slight resistance to the 17.5 per cent caustic used in the a-cellulose test. The cellulose assumed an almost colloidal state and even passed through a fritted glass washing funnel. By substracting the lignin from the a-cellulose to secure the true a-value, we note a slight variation in a-content with increased sulphidity.

The copper number, which might be classified as an indication of the extent and rate of degradation of cellulose stocks as a result of acid hydrolysis or oxidation, seems

TABLE IV—CHEMICAL TESTS ON PULP

Cook Number	A—Cellulose: Unbl.	Single Stage Bleach	Double Stage Bleach	Copper Number: Unbl.	Single Stage Bleach	Double Stage Bleach	Lignin: Unbl.	Cuprammonium Viscosity: Single Stage Bleach	Double Stage Bleach
1	81.7	73.9	32.4	.63	1.57	2.45	5.36	8.97	7.53
2	82.3	71.6	26.1	.77	1.66	4.20	2.90	10.13	5.84
3	81.6	68.7	44.0	.82	2.39	5.18	3.50	9.22	6.34
4	82.1	76.5	73.0	.98	1.57	3.18	5.27	23.49	11.77
5	83.3	77.0	73.5	1.18	1.71	2.39	5.45	23.66	10.35
6	83.5	77.2	71.0	1.58	2.42	3.24	8.20	18.34	8.13
7	82.5	77.1	71.5	1.61	2.14	2.45	7.17	20.79	23.41
8	...	...	...	...	...	...	26.5	...	...
9	...	...	...	...	...	...	29.8	...	...

to increase slightly with increasing sulphidity and quite materially in the single and double stage bleached pulps.

LIGNIN

The lignin in the unbleached pulps increases slightly with increased sulphidity showing incomplete removal of ligneous materials with decrease in caustic and increase of sulphide in the cooking liquors. The lignin test, while yielding substances of uncertain constitution, gives fairly concordant values if the pulp is well washed and then extracted with alcohol benzine previous to the determination. It was apparent that what we had considered to be very well washed pulp in reality was very incompletely washed, as shown by the dark extract or refluxing with alcohol benzine. Especially in the case of the rawer pulps was it almost impossible to remove the final traces of black liquor on washing. There is apparently a considerable absorption force exerted between the raw pulps and the various sodium compounds used or produced in the cooking operation.

CUPRAMMONIUM VISCOSITY

The viscosity of a solution of pulp in cuprammonium hydroxide has been used especially in the rag industry for following the degradation of cellulose during the processing of a stock. The viscosities of these various pulps have been determined by the usual method, but it is not possible to draw any conclusions as to the degree of degradation of the cellulose since so many of the values are extremely low approaching very closely the viscosity of the cuprammonium solvent itself. It should be noted that little is known of the significance of the viscosity test as applied to wood pulps of various types. Unbleached pulps may give abnormally high values because of the lignin present, for lignin is insoluble in the cuprammonium solvent and not only causes lowering of the concentration of the cellulose solution, but also clogs up the outlet of the viscosity tube.

In general, we have endeavored to show the results of variation in sulphidity on the physical and chemical qualities of kraft pulps. Under the conditions which we have chosen it is apparent that one is restricted to fairly narrow limits as to the ratio of caustic to sulphide if one desires to obtain a good yield of acceptable pulp possessing fairly well defined physical characteristics. If one wishes to secure an easy bleaching alkaline pulp of low bleachability we must immediately sacrifice yield of pulp. By altering our bleaching methods we can undoubtedly obtain greater results than by modifying the cooking procedure. Pulps of better quality can be obtained by less drastic cooking conditions and finishing the method of purification by suitable bleaching and washing operations.

Conclusions

Under a given set of conditions for the cooking of kraft pulp we note that:

(1) Increasing sulphidity results in a greater total yield although beyond certain fairly well defined limits the yield of pulp decreases and screenings increase.

(2) Longer cooking time at higher sulphidities does not serve to produce an acceptable pulp.

(3) The cooks made indicate that two parts of caustic to one of sodium sulphide plus or minor a normal variation in sulphidity occasioned by minor variations in the recovery operations, will produce an unbleached pulp of maximum yield of screenable stock of good strength and with screenings sufficiently softened so that they can be reduced by mechanical means.

(4) The color of the unbleached pulp produced by the two to one ratio was quite satisfactory. Although the physical tests indicate the three to two ratio pulp to be just as good, the color was far from acceptable, being considerably darkened.

(5) While the quality of the three to two ratio pulp was quite satisfactory, the power consumption was unduly large for a given hydration.

(6) If a bleached pulp of maximum strength is not required, then raw stock, fairly softly cooked, will require a more reasonable chlorine consumption at low shrinkage; if, however, the strongest bleached stock is desired in which practically no loss in strength over unbleached pulps is shown, then uniformly well cooked, rather hard raw pulp is required. The chlorine consumption of a pulp of this kind, however, is increased and the shrinkage will be higher.

(7) Shrinkage by chlorination-hypochlorate is considerably greater than by single stage hypochlorite bleaching.

(8) Physical tests are markedly affected by ratio of caustic to sulphide and by method of purification.

(9) Chemical tests appear to offer very little indication of the physical qualities of pulp produced under these conditions.

Favor Industrial Control Bill

[FROM OUR REGULAR CORRESPONDENT]

OGDENBURG, N. Y., June 12, 1933—Several of the paper mill men in northern New York favor the congressional passage of the Industrial Control bill providing for regulation of the production, labor and market factors of industries in this country so as to stimulate production and assure steady work. Officials of the Algonquin Paper Company say that they believe that it is the one thing necessary to start up manufacture in this country and that it will be a benefit to industry, to labor and to the utilization of materials. The management of the Sherman Paper Company say that they think it will be a wonderful thing for everybody as it will put business on a profitable basis and will fix a minimum wage scale for the working man who will be brought back to normal numbers on payrolls. Leading officials of Bagley & Sewall Company think that if the program isn't carried too far it is bound to react to the benefit of all manufacturers, to labor and to the public generally. In their opinion the government is trying to help industry and leaders of industry everywhere should respond by taking advantage of the opportunity offered.

A number of other manufacturers were reluctant to discuss the bill while others said they were not sufficiently acquainted with it to express their views. No comment was given by the Dexter Paper Company, in view of the fact that the head official of the concern was out of town. A prominent official of the Gould Paper Company of Lyons Falls said that he was not sufficiently conversant with the measure to give any opinion until certain matters concerning it were ironed out.

Watertown Reports Improvement

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., June 12, 1933—Local manufacturers identified with the paper trade are inclined to believe that there is a decided improvement in business conditions with indications that the trend will continue upward. Officials of Bagley & Sewall Company reported their May business was much better than the April business. They believe there is definite progress in business improvement and the outlook is very encouraging. The firm of Knowlton Bros. report seasonable business and a tendency toward improvement.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JUNE 10, 1933

CIGARETTE PAPER

Standard Products Corp., Paris, Havre, 30 cs.; American Tobacco Co., Paris, Havre, 75 cs.; De Manduit Paper Corp., Pr. Harding, Havre, 220 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., American Trader, London, 4 bls., 1 cs.

NEWS PRINT

Jay Madden Corp., Gen. von Steuben, Bremen, 137 rolls; Perkins Goodwin & Co., Gen. von Steuben, Bremen, 65 rolls; Newark Evening News, Donnacona I, Donnacona, 574 rolls; Gilman Paper Co., Sagoporack, Helsingfors, 158 rolls; Lunham & Reeve, Sagoporack, Helsingfors, 252 rolls; Jay Madden Corp., Pr. Harding, Hamburg, 134 rolls; Baldwin Paper Co., New York, Hamburg 55 rolls.

PRINTING PAPER

Steiner Paper Corp., Statendam, Rotterdam, 5 cs.; Ozalid Corp., Statendam, Rotterdam, 10 cs.; E. Dietzgen & Co., New York, Hamburg, 91 cs.

WRAPPING PAPER

R. McBratney Co. Inc., California, Glasgow, 2 cs.; ——, Pr. Harding, Hamburg, 221 rolls.

BRISTOL BOARDS

Devoe & Raynolds, American Trader, London, 1 cs.

DRAWING PAPER

Devoe & Raynolds, American Trader, London, 4 cs.

FILTER PAPER

H. Reeve Angel & Co. Inc., American Trader, London, 9 cs.

FILTER PULP

——, Pr. Harding, Hamburg, 30 bls., 1 cs.

FILTER MASS

——, New York, Hamburg, 20 bls.

SURFACE COATED PAPER

P. C. Zuhlke, Minnewaska, Antwerp, 11 cs.; Gevaert Co. of America, Minnewaska, Antwerp, 45 cs.; Globe Shipping Co., Gen Von Steuben, Bremen, 25 cs.; International F'd'g Co., New York, Hamburg, 2 cs.; Globe Shipping Co., New York, Hamburg, 2cs.; Baer Bros., New York, Hamburg, 3 cs.

METAL COATED PAPER

Globe Shipping Co., Gen von Steuben, Bremen, 22 cs.; National City Bank, Gen. von Steuben, Bremen, 10 cs.; K. Pauli Co., New York, Hamburg, 3 cs.; Globe Shipping Co., New York, Hamburg, 24 cs.

COATED PAPER

Chas. Happel, New York, Hamburg, 7 cs.

TISSUE PAPER

Van Oppen & Co., Pr. Monroe, Marseilles, 15 cs.; W. J. Byrnes, Laconia, Liverpool, 1 cs.; W. J. Byrnes, Aquitania, Southampton, 1 cs.

PARCHMENT PAPER

Phoenix Shipping Co., Gen. von Steuben, Bremen, 4 cs.

COLORED PAPER

American Express Co., Gen. von Steuben, Bremen 5 cs.

TRANSFER PICTURES

Manhattan Decalcomania Co., Gen von Steuben, Bremen, 1 cs.; Rohner Gehrig & Co., Bremen, Bremen, 6 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Laconia, Liverpool 28 cs.

DECALCOMANIAS

Sellers Transportation Co., Bremen, Bremen, 15 cs.

FACING PAPER

National Car. Trading Co., Minnewaska, Antwerp, 9 cs.

BOWL PAPER

Hurley Johnson Corp., Laconia, Liverpool, 23 bls.

GUMMED PAPER

Heemsoth Basse & Co., Bremen, Bremen, 9 cs.

WRITING PAPER

D. E. Bordner, New York, Hamburg, 1 bl., 1 cs.

MISCELLANEOUS PAPER

International F'd'g Co., Statendam, Rotterdam, 5 cs.; Keuffel & Esser Co., Pr. Harding, Hamburg, 32 cs.; Atlantic F'd'g Co., New York, Hamburg, 9 cs.; ——, New York, Hamburg, 146 rolls, 25 bls.; Japan Paper Co., P. Maersk, Kobe, 25 cs.

RAGS, BAGGINGS, ETC.

Royal Manfg Co., P. Maersk, Kobe, 50 bls. thread waste; A. M. Schmid Co., New York, Hamburg, 10 bls. rags; E. J. Keller Co. Inc., Black Heron, ——, 84 bls. bagging; ——, American Trader, London, 178 bls. rags; Castle & Overton, Inc., American Trader, London, 114 bls. rags; Banco Coml Italiane Trust Co., American Trader, London, 67 bls. paper stock; Van Oppen & Co., Pr. Harding, Hamburg, 123 bls. bagging; ——, Pr. Harding, Hamburg, 67 bls. rags; ——, California, Glasgow, 71 bls. rags; C. Nelson, California, Glasgow, 106 bls. rags; E. J. Keller Co. Inc., Excambion, ——, 83 bls. rags.

OLD ROPE

Banco Coml Italiane Trust Co., Gen. von Steuben, Bremen, 33 coils; ——, Estrella, Barcelona, 38 bls.; Banco Coml Italiane Trust Co., Pr. Harding, Hamburg, 39 coils; Banco Coml Italiane Trust Co., C. G. Thulin, Genoa, 177 coils; E. J. Keller Co. Inc., Black Gull, ——, 89 coils.

HIDE GLUE, ETC.

——, Gen. von Steuben, Bremen, 125 bags hide glue; ——, Statendam, Rotterdam, 440 bags bone glue.

CHINA CLAY

Whitaker Clark & Daniels, Laconia, Liverpool, 390 bags.

CASEIN

——, American Legion, B. Ayres, 417 bags; Tupman Thurlow Co. Inc., American Legion, B. Ayres, 168 bags.

WOOD PULP

A. Giese & Son, Statendam, Rotterdam, 100 bls. wood pulp; J. Manheimer, Statendam, Rotterdam, 60 bls. wood pulp; Lagerloef Trading Co., Sagoporack, Helsingfors, 940 bls. sulphite, 189 tons; J. Andersen & Co., Sagoporack, Hernosand, 3,000 bls. sulphate, 500 tons; Perkins Goodwin & Co., Sagoporack, Sundsvall, 1,500 bls. sulphite; Castle & Overton, Inc., New York, Hamburg; 420 bls. wood pulp, 84 tons; Bulkley Dunton & Co., Simon von Utrecht, ——, 3,000 bls. wood pulp.

PULPWOOD

Polarus Shipping Co., Keret, Guysboro, N. S., 1,030 cords.

ALBANY IMPORTS

WEEK ENDING JUNE 10, 1933

Fraser Industries, Inc., Vesta, Campbellton, N. B., 5,627 bls. sulphite, 1,000 tons; Bulkley Dunton & Co., Simon von Utrecht, ——, 2,250 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING JUNE 10, 1933

Gottesman & Co. Inc., Helle, Sweden, 6,000 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING JUNE 10, 1933

Atkinson Haserick & Co., Pr. Monroe, Genoa, 2 cs., wrapping paper; ——, Laconia, Liverpool, 27 bls. rags; F. S. Webster, Laconia, Liverpool, 4 cs. tissue paper; G. F. Malcolm Co., Laconia, Liverpool, 8 cs. tissue paper; E. J. Keller Co. Inc., Westerwald, ——, 336 bls. wood pulp; Gottesman & Co. Inc., Svaneholm, Sweden, 1,550 bls. wood pulp; Bulkley Dunton & Co., Grandon, ——, 250 bls. wood pulp; Bulkley Dunton & Co., Trolleholm, ——, 1,000 bls. wood pulp; Bulkley Dunton & Co., Westerwald, ——, 500 bls. wood pulp; Bulkley Dunton & Co., Simon von Utrecht, ——, 750 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING JUNE 10, 1933

Castle & Overton, Inc., Estrella, Barcelona, 9 bls. rags; Paper Manfg Co., Sagoporack, Helsingfors, 64 rolls news print; J. W. Hampton, Jr. Co., Sagoporack, Helsingfors, 25 rolls news print; Lagerloef Trading Co., Sagoporack, Helsingfors, 127 bls. ground pulp, 25 tons; Pagel Horton & Co. Inc., Sagoporack, Husum, 12,000 bls. sulphite, 2,000 tons; Parsons & Whittemore, Inc., Sagoporack, Sundsvall, 60 rolls news print; E. J. Keller Co. Inc., Collamer, ——, 229 bls rags; Gottesman & Co. Inc., Helle, Sweden, 6,000 bls. wood pulp; Gottesman & Co. Inc., Trolleholm, Sweden, 525 bls. wood pulp; Bulkley Dunton & Co., Trolleholm, ——, 250 bls. wood pulp.

CAMDEN IMPORTS

WEEK ENDING JUNE 10, 1933

Perkins Goodwin & Co., Sagoporack, Sundsvall, 1,500 bls. sulphate; Bulkley Dunton & Co., Simon von Utrecht, ——, 500 bls. wood pulp.

WILMINGTON IMPORTS

WEEK ENDING JUNE 10, 1933

Price & Pierce, Ltd., Sagoporack, Skelleftehamn, 6,000 bls. chemical pulp, 1,000 tons.

NORFOLK IMPORTS

WEEK ENDING JUNE 10, 1933

National City Bank, C. G. Thulin, Barcelona, 161 bls. bagging; Castle & Overton, Inc., C. G. Thulin, Barcelona, 689 bls. bagging; ——, C. G. Thulin, Barcelona, 88 bls. jute waste.

NEWPORT NEWS IMPORTS

WEEK ENDING JUNE 10, 1933

Gottesman & Co. Inc., Trolleholm, Sweden, 2,275 bls. wood pulp.

New Fiber with Cellulose Base

Once again sicence has come to the aid of the textile industries, says M. C. D. Crawford in *Women's Wear Daily*. A new and very interesting fiber has been produced from a cellulose basis that has a definite place in a variety of products. Unlike the synthetic fiber, this new product is not first reduced to a liquid form and then formed into filament for throwing and spinning. The process merely removes all elements except the purest cellulose and leaves this in the form of delicate natural fibers.

This product is known as "Solka," a name derived from the Egyptian words meaning bright sun. It is manufactured by the Brown Company, of Portland, Me., in its factories in Berlin, N. H., and La Tuque, Canada. The product already has found uses as sewing thread for shoes, in roofing materials, and in rugs. Thus far, it has not been spun in fine counts.

It is in no sense a rival or a substitute for rayon or other fibers. It is an absolutely new product. The yarn is strong, practically free from shrinkage. It generally is stock dyed, which, it is contended, produces better colors.

The immediate uses for the product are highly varied. As a material for summer and beach shoes its strength and the fact that it will not shrink and that it will take fast dyes smoothly, are important. For many upholstery purposes, it is unique.

Beach wear and slacks are possibilities, and it can be made into hats and bags. It may be combined with other materials, thus creating new effects. The product can be quantitatively controlled, and there need never be overproduction, as in natural fibers; there need never be dangerous exploitation due to speculation or the vagaries of world markets. The mills first learning its possibilities and developing its uses will have a certain stability of basic control impossible in materials of more general usage.

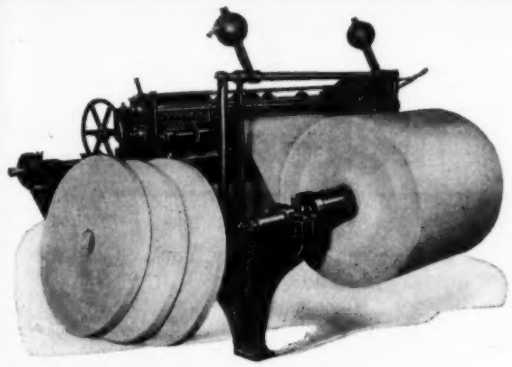
How rapidly it will find acceptance in the textile markets depends on the general attitude of the textile imagination and the rate of progress made in the development of new products by the producer.

One thing is certain: a new product has come into the textile horizon at a time when new ideas and products are at a premium.

It is curious how the end of each depression is marked by new products resulting from research, vision, and good judgment.

Solka is a yarn made of the fiber of pure cellulose. In the case of the present yarn output, most of it is made from spruce wood or hemp cellulose. The fibers are short and are spun wet. The resulting thread can be varied in character and samples shown ranged from strengths inferior or greater than the equivalent sizes of carded cotton yarn. It is possible to coat the finished fabrics with pyroxylin materials making them waterproof. Cire effects are also obtainable.

For the most part the yarns are of coarse counts at present, but it is said that additional equipment and refinements in manufacturing will allow for the spinning of finer yarns.



HEAVY DUTY SLITTER and REWINDER

Designed to meet the requirements of all users of Automatic Machines that take the stock from the roll, and require a roll of large diameter wound true and solid.

With this slitter, wide and narrow widths cut at the same time are of uniform tension. A roll slit and rewound 1″ wide and 48″ diameter can be handled without danger of spinning. At very little additional cost per ton paper mills equipped with this Slitter can furnish their customers with paper or board slit and rewound from 1″ width and up. Made in thee widths: 48″—60″—72″.

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English Weave—Fine Face Felt in Three, Four, Five and Six Ply—60″ to 214″ in width—insure large production. Absolutely no felt marks in paper.

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Solka, a highly purified alpha cellulose yarn is the most talked of product in the textile industry—

A number of textile manufacturers are using it to improve the quality of their products, and scores of other textile people have it under consideration, and will adopt its use very shortly—

A great many paper manufacturers are also using Solka to give their papers strength, character, permanence and durability, and to improve the general appearance of their papers.

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New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, June 14, 1933.

Conditions in the local paper market continue to improve. Demand for the various standard grades of paper is persistent. Sales forces of the leading paper houses are conducting a strenuous campaign for orders. Quotations on raw materials are rising and higher prices for all grades of paper are anticipated.

The news print paper market is displaying a stronger undertone and hopes are freely expressed that this section of the industry will eventually benefit from the general advance. Production in the United States, Canada and Newfoundland is being maintained in sufficient volume to take care of current needs.

Demand for the various grades of paper board is satisfactory. Quotations have advanced all along the line. The fine paper market is more lively than for some time past. Tissues are going forward freely. The coarse paper market is steadier and kraft wrapping paper prices are holding up well.

Mechanical Pulp

The ground wood pulp market is showing signs of improvement. Contract shipments are moving in good volume. Prices are firmer. No. 1 imported moist mechanical pulp is now quoted at from $22 to $23 per ton, on dock, Atlantic ports; while foreign dry ground wood pulp is selling at the same figure.

Chemical Pulp

Sentiment in the chemical pulp market is better. Inquiries for future account are fairly numerous. Prices are firmer. Imported bleached sulphite is quoted at from $2.00 to $2.40; easy bleaching at from $1.60 to $1.75; No. 1 strong unbleached at from $1.55 to $1.65 and bleached sulphate at from $2.15 to $2.75; all on dock, Atlantic ports.

Old Rope and Bagging

The old rope market is firmer. Offerings of both imported and domestic old manila rope are limited and quotations higher. Small mixed rope is fairly active. The bagging market is stronger. Scrap and gunny bagging are in good request, while roofing bagging is seasonally active. Prices are steady to firm.

Rags

Paper mill interest in the domestic rag market is more in evidence. New cotton rags are buoyant and quotations have risen generally. No. 1 new white shirt cuttings have advanced to from $5.50 to $6.00 and other grades are decidedly firmer, especially roofing rags. The imported rag market is sharing in the general improvement.

Waste Paper

The paper stock market was exceedingly lively during the past week. Prices on the lower grades of waste paper, in particular, are running wild. No. 1 mixed paper is now quoted at from 65 to 70 cents and strictly folded news at from 60 to 70 cents, f.o.b. New York. Quotations on the better grades are also higher.

Twine

Steadiness prevails in the local twine market. Demand for the various grades is fairly active. There are a number of inquiries around, some of which should materialize into good orders. Prices are generally holding to previously quoted levels and reports of concessions are infrequent.

Carthage Paper Makers Raise Wages

CARTHAGE, N. Y., June 12, 1933—Labor troubles broke out this week at the plant of Carthage Paper Makers Inc., following the announcement of a new wage scale and operations were hampered for several hours. The company announced a five per cent increase but a group of workers demanded a further raise which was not forthcoming. A conference between officials and strikers resulted at which a statement was given out that a further wage increase was impossible even though the company might desire it. The majority of the strikers agreed to continue work but several of them decided to leave their jobs. However a number of new hands were secured in a short time and work was resumed the following day.

Operation of the mill has been unusually successful. When the mill reopened operations were conducted on a single shift basis but a rush of orders followed which resulted in rapid expansion. Early in the winter it became necessary to operate the plant with day and night shifts and that schedule has been observed since. Increased wages were promised the workers some time ago upon the improvement in conditions. The company was organized late last fall as a cooperative venture principally to provide employment for idle paper mill hands in this village. The plant is being operated under a lease acquired from the Carthage Pulp and Board Company.

Glassophane Products Syndicate Formed

Alex Malm, consulting mechanical engineer, who is well known in the paper industry, announces that after several years of research and laboratory experiments, he has succeeded in completing a neutral chemical which will make certain kinds of paper transparent and also oil, grease and water proof.

A new organization known as the Glassophane Products Syndicate, 34 South 17 Street, Philadelphia, Pa., has been formed for the purpose of building special coating machines and also automatic machines for making this new transparent sheet into milk bottles, beer bottles, oil containers, cups, round canisters, etc.

Associated with Mr. Malm in this new enterprise are Harry W. Scott, John W. Scott, Jr., and Morton R. Craven. This new syndicate owns all the well-known Malm Rotary Patents and chemical processes. It is expected that a new automatic machine for turning out this new type milk bottle will be in operation by September.

1864 1933

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for every grade of

PULP AND PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made the first endless paper machine felts manufactured in America

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Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

SOLD BY
BULKLEY, DUNTON & COMPANY
75-77 Duane St., N. Y., and direct

Tons of paper saved every month!

In one large New England mill, the superintendent advises that their save-alls now have no trace of slime. Previously these machines would be badly slime-coated. But, now that the entire system is given periodic cleanings with MAGNUS SLIME REMOVER, they save many tons of paper every month. For the paper comes through so clean when the machines are started up each week, there is no waste.

The effectiveness of MAGNUS SLIME REMOVER and the remarkable savings resulting from its use, are items well worthwhile investigating. Write today for data sheets giving full information about this efficient cleansing agent. Or, we will gladly send a barrel of MAGNUS SLIME REMOVER to you on 30-days trial. Our money-back guarantee protects you.

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KRAFT WRAPPING AND KRAFT ENVELOPE
Bleached Spruce Sulphite Pulp, Soda and Kraft Pulp

MILLS:

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PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, June 14, 1933.

BLANC FIXE.—The blanc fixe market is practically unchanged. Prices are generally holding to schedule. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk; while the powder is selling at from 3 to 3½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Conditions in the bleaching powder market are improving. The contract movement is well up to average. Prices are steady to firm, in most instances. Bleaching powder is quoted at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—The casein market continues firm. Domestic casein is quoted at 10½ to 11 cents and finely ground at 11 to 11½ cents per pound. Argentine standard ground is selling at 9⅞ cents and finely ground at 10½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is persistent. The contract movement is fairly heavy. Prices are firm. Solid caustic soda is quoted at from $2.55 to $3.00; while the flake and ground are selling at from $2.95 to $3.00 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is exhibiting a strong undertone. Prices are well maintained. Imported china clay is now quoted at from $12 to $17 per ton, ship side; while domestic paper making clay is selling at from $4.50 to $12 per ton, at mine.

CHLORINE.—Trading in the chlorine market is quite active. Shipments against contract are going forward in good volume. Prices are holding to schedule. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is irregular. The grades of gum rosin used in the paper mills are now quoted at from $4.50 to $4.65 per 280 pounds, in barrels, at works; while wood rosin is selling at $3.50 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Paper mill demand for salt cake is broader. Prices are firm. Salt cake is quoted at from $13.50 to $14; chrome salt cake at from $13 to $13.50 per ton, at works; while imported salt cake is selling at from $13.50 to $14 per ton, on dock.

SODA ASH.—The soda ash market is buoyant. Demand is more active than for some time past. Prices are holding to schedule. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.30; and in barrels, $1.43.

STARCH.—Steadiness prevails in the starch market. Contract shipments are proceeding in seasonal volume. Prices are firm. Special paper making starch is quoted at $2.64 per 100 pounds, in bags; and at $2.91 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Business in the sulphate of alumina market is much better. Prices are well maintained. Commercial grades are quoted at from $1.25 to $1.46; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market is routine. The contract movement is normal. Domestic talc is still quoted at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is selling at from $18 to $22 per ton, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@38.00
Bonds	4.75	@53.25
Index	6.00	@12.00
Writings—		
Extra Superfine	6.50	@15.00
Superfine	6.25	@14.75
Tub sized	4.50	@ 7.00
Engine sized	4.00	@ 5.00
Book, Cased—		
S. & S. C.	4.25	@ 5.00
M. F.	3.75	@ 4.25
Coated and Enamel	5.00	@ 9.00
Lithograph	5.00	@ 9.00
Tissues—Per Ream—		
White No. 1	.50	@ .70
White No. 2	.45	@ .60
Anti-Tarnish M. G. only	.65	@ .70
Colored	.70	@ .90
Kraft	.65	@ .70
Manila	.55	@ .60
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.00	@ 5.25
No. 2 Wood	3.50	@ 4.00
Butchers	3.37½	@ —
Fibre Papers—		
No. 1 Fibre	4.25	@ 5.50
No. 2 Fibre	4.00	@ 4.75
Common Bogus	1.50	@ 3.00
Screenings	2.00	@ 3.00
Card Middles	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs., No. 1	.09¼	@ —
No. 2	.11¼	@ —
Bleached, basis 20 lbs.	.11¼	@ —

(Delivered New York)

News, per ton—		
Roll, contract	40.00	@ —
Rolls, spot	40.00	@ —
Sheets	45.00	@ —
Side Runs	25.00	@ —
Kraft—		
No. 1 Domestic	4.50	@ 4.75
No. 2 Domestic	3.00	@ 3.25
Southern	3.00	@ 3.25
Imported	2.75	@ 3.50
Boards—per ton—		
News	37.50	@40.00
Straw	32.50	@35.00
Chip	35.00	@37.50
Binders Boards	62.00	@70.00
Kraft Liner	47.50	@50.00
Standard 85 Test Jute Liner	30.00	@32.50
Sgl. Mla. Ll. Chip.	45.00	@47.50

(F. o. b. Mill)

Wood Pulp Boards	70.00	@80.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—		
Moist	22.00	@23.00
Dry	22.00	@23.00

(F. o. b. Mill)

No. 1 Domestic and Canadian	14.00	@22.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	2.00	@ 2.40
Easy Bleaching	1.60	@ 1.75
No. 1 strong unbleached	1.55	@ 1.65
Mitscherlich unbleached	1.60	@ 1.75
No. 2 strong unbleached	1.40	@ 1.45
No. 1 Kraft	1.25	@ 1.45
No. 2 Kraft	1.10	@ 1.15
Sulphate—		
Bleached	2.15	@ 2.75

(F. o. b. Pulp Mill)

Sulphite (Domestic and Canadian)—		
Bleached	1.75	@ 3.75
Easy Bleaching	1.60	@ 1.75
News	1.40	@ 1.65
Mitscherlich unbleached	2.00	@ 2.25
Kraft (Domestic)	1.25	@ 2.75

(Delivered Paper Mills)

Soda Bleached	2.00	@ —

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1.	5.50	@ 6.00
Silesias No. 1	3.75	@ 4.25
New Unbleached	5.50	@ 6.00
New Soft Blacks	3.00	@ 3.25
Blue Overall	2.75	@ 3.25
Fancy	1.50	@ 1.75
Washables	1.25	@ 1.50
Mixed Khaki Cuttings	2.50	@ 2.75
O. D. Khaki Cuttings	2.75	@ 3.25
Men's Corduroy	1.50	@ 1.75
New Mixed Blacks	2.50	@ 2.75

Old Rags

White, No. 1—		
Repacked	3.75	@ 4.00
Miscellaneous	3.00	@ 3.50
White, No. 2—		
Repacked	2.00	@ 2.50
Miscellaneous	1.75	@ 2.00
Thirds and Blues—		
Repacked	1.75	@ 2.00
Miscellaneous	1.50	@ 1.75
Black Stockings	2.50	@ 3.00
Roofing Rags—		
No. 1	.70	@ .80
No. 2	.60	@ .70
No. 3	.55	@ .60
No. 4	.50	@ .55
No. 5A	.45	@ .50

Foreign Rags

New Rags

New Dark Cuttings	1.50	@ 1.60
New Mixed Cuttings	1.60	@ 1.70
New Light Silesias	3.25	@ 3.50
Light Flannelettes	3.00	@ 3.25
Unbleached Cuttings	5.00	@ 5.25
New White Cuttings	4.50	@ 4.75
New Light Oxfords	3.25	@ 3.50
New Light Prints	2.00	@ 2.25

Old Rags

No. 1 White Linens	6.00	@ 6.50
No. 2 White Linens	5.25	@ 5.75
No. 3 White Linens	4.25	@ 4.00
No. 4 White Linens	2.00	@ 2.25
No. 1 White Cotton	3.75	@ 4.00
No. 2 White Cotton	3.00	@ 3.25
No. 3 White Cotton	2.50	@ 2.75
No. 4 White Cotton	1.50	@ 1.60
Extra Light Prints	2.00	@ 2.25
Ord. Light Prints	1.75	@ 1.85
Med. Light Prints	1.55	@ 1.65
Dutch Blue Cottons	1.65	@ 1.80
French Blue Linens	2.10	@ 2.25
German Blue Linens	1.85	@ 2.00
German Blue Cottons	1.35	@ 1.50
Checks and Blues	1.30	@ 1.40
Lindsay Garments	1.00	@ 1.10
Dark Cottons	.90	@ 1.00
Old Shopperies	.85	@ .90
New Shopperies	.80	@ .85
French Blues	1.50	@ 1.65

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.05	@ 1.15
Domestic	1.05	@ 1.15
Wool Tares, light	.90	@ 1.00
Wool Tares, heavy	.90	@ 1.00
Bright Bagging	.90	@ .95
Manila Rope—		
Foreign	1.85	@ 2.00
Domestic	1.70	@ 1.80
Small Mixed Rope	.60	@ .65
New Burlap Cut	1.25	@ 1.50
Hessian Jute Threads—		
Foreign	2.60	@ 2.75
Domestic	2.80	@ 3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
White Envelope Cuttings	2.35	@ 2.50
Ordinary Hard White No. 1	2.15	@ 2.25
Hard White No. 2	1.70	@ 1.80
Soft White No. 1.	1.60	@ 1.70
Flat Stock—		
Stitchless	.85	@ .95
Overissue Mag.	.85	@ .95
Solid Flat Book	.80	@ .90
Crumpled No. 1	Nominal	
Solid Book Ledger	1.50	@ 1.75
Ledger Stock	.90	@ 1.00
New B. B. Chips	.60	@ .70
Manilas—		
New Env. Cut	1.60	@ 1.70
New Cuttings	1.20	@ 1.25
Extra No. 1 old	.90	@ 1.00
Print	Nominal	
Bogus Wrapper	.60	@ .70
Container	.65	@ .75
Old Kraft Machine—		
Compressed bales	1.00	@ 1.10
News—		
No. 1 White News	1.10	@ 1.15
Strictly Overissue	.65	@ .75
Strictly Folded	.60	@ .70
No. 1 Mixed Paper	.65	@ .70

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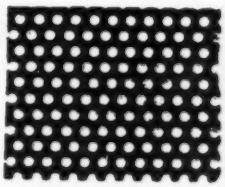

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WE were very pleased to meet so many old friends at the Annual Convention, which was very instructive and has resulted in all of us returning home with a feeling of confidence in the future and a desire to work out our various problems in such a way as to make the next year a very prosperous one for the Paper Industry.

H. & M.

hope to assist you and will welcome your inquiries at any time that we may be of service.

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Twines
(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	15¼	@	16¼
No. 2	.11¾	@	.12¾
Jute Rope—			
4-ply and larger	.08¼	@	.10¾
Fine Tube Rope—			
4-ply	.12¾	@	.12¾
3-ply	.13¼	@	.13¾
2-ply	.14¼	@	.14¾
Paper Makers Twine Balls	.09¼	@	.11¼
Box Twine, 2-3 ply	.11¼	@	.12¾
Jute Rope	.09	@	.10
White Hemp	.12¾	@	.15¾
Java Sisal—			
No. 1 Basis	.11½	@	—
No. 2 Basis	.10½	@	—
New Zealand Sisal Lath Yarn—			
No. 1	.13½	@	.15½
No. 2	.11½	@	.13½
Manila Twine	.24½	@	.29½

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.04	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.07	@	.18
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¾	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¼	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¾	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04½	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	3.50	@	4.50
Southern Kraft	2.62½	@	—
No. 2 Kraft	2.62½	@	—
Wood Tag Boards	.04¾	@	.06¼
Sulphite Screenings	.03	@	.03½
Manila Tissue	.07	@	.07½
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	45.00	@	—
Sheets	50.00	@	—
Boards, per ton—			
Plain Chip	27.50	@	—
Solid News	30.00	@	—
Manila Lined Chip	37.50	@	—
Patent coated	47.50	@	—
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.50	@	1.55
No. 1 Hard White	1.40	@	1.45
No. 1 Soft White	1.00	@	1.10
Ledger & Writings	.55	@	.60
Solid Books	.45	@	.50
Blanks	1.00	@	1.05
Kraffs	.70	@	.80
New Kraft Cuts	1.15	@	1.25
Manila Env. Cuts	1.25	@	1.30
Ex. No 1 Manila	.90	@	1.00
Print Manila	.30	@	.40
Overissue News	.45	@	.50
Old Newspapers—			
No. 1	.45	@	.50
Mixed Papers—			
No. 1	.25	@	.30
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.04	@	.40
Ledgers	.06	@	.40
Writings—			
Superfine	.10	@	.18
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Fine No. 3	.05½	@	.18
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.06	@	.09
Manila Sul., No. 1	.03	@	.05
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¼	@	.04¼
Southern Kraft	2.75	@	4.00
common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	46.00	@	50.00
Straw Board	37.00	@	40.00
News Board	35.00	@	37.00
Chip Board	35.00	@	37.00
Wood Pulp Board	70.00	@	85.00
Roofing Boards			
No. 1, per ton	75.00	@	77.00
No. 2, per ton	65.00	@	70.00
Carload lots	60.00	@	70.00
Tarred Felts			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.03½	@	.04
New White, No. 2	.02½	@	.04
Light Silesias	.02¾	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.04½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.45
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.51
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	1.65	@	1.70
No. 2 Hard White	1.50	@	1.60
No. 1 Soft White	1.40	@	1.45
No. 2 Soft White	1.10	@	1.15
No. 1 Mixed	.50	@	.60
No. 2 Mixed	.40	@	.50
Solid Ledger Stock	1.20	@	1.25
Writing Paper	.70	@	.75
No. 1 Books, heavy	.55	@	.60
No. 2 Books, light	.40	@	.45
No. 1 New Manila	1.20	@	1.25
No. 1 Old Manila	.60	@	.65
Print Manila	.50	@	.55
Container Manila	.50	@	.55
Old Kraft	.85	@	.90
Common Paper	.30	@	.35
No. 1 Mixed Paper	.50	@	.55
Straw Board, Chip	.35	@	.45
Binders Board Chip	.40	@	.45
Corrugated Board	.50	@	.60
Overissue News	.60	@	.65
Olds Newspaper	.50	@	.55

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.05¾	@	.11½
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No 1 Kraft	—	@	.04¾
No. 2 Kraft	.03	@	—
(F. o. b. Boston)			
Southern Kraft	.03	@	—
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print, rolls	44.50	@	—
Straw Board, rolls	.009	—	@35.00
Straw Board in Sheets, basis 35s to 70s	—	@40.00	
Filled News Board	37.50	@42.50	
Chip Board	35.00	@40.00	
Chip Board (Creasing)	37.50	@42.50	
Single Manila Lined Chip	45.00	@	—
Single White, Patent Coated News Board—			
Bender	55.00	@60.00	
Wood Pulp Board	70.00	@75.00	
Binder Boards	62.00	@75.00	

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Soft White	1.40	@	1.70
No. 1 Old Manila	.50	@	.60
No. 1 Mixed	.80	@	.90
No. 2 Mixed	.40	@	.50
Solid Ledger Books	1.20	@	1.40
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.60	@	.70
No. 1 Books, heavy	.55	@	.65
No. 1 Books, light	—	@	.30
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.50	@	.60
White Blank News	1.00	@	1.05
No. 1 Kraft	.85	@	.95
Manila	.80	@	.90
No. 1 Mixed Papers	.42½	@	.45
Print Manila	.55	@	.60
Overissue News	.55	@	.60
Old Newspapers	.57½	@	—
Box Board Chips	.40	@	.42½
Corrugated Boxes	.57½	@	—
Screening Wrappers	.57½	@	—

Bagging
(F. o. b. Boston)

Manila Rope—			
Foreign	1.55	@	1.70
Domestic	1.55	@	1.75
Transmission Rope	1.20	@	—
Mixed Strings	.25	@	.30
Jute Rope	.85	@	—
Jute Carpet Threads	.45	@	.30
Gunny No. 1—			
Foreign	1.20	@	—
Domestic	.70	@	.80
Bleachery Burlap	1.90	@	2.00
Scrap Burlap	.65	@	.75
No. 1 Scrap Burlap	.75	@	.80
Scrap Sisal	.80	@	1.00
Scrap Sisal for shredding	1.10	@	—
Wool Tares, heavy	.90	@	1.00
New Burlap Cutting	.75	@	.90
Australian Wool Pouches	2.00	@	2.25
Heavy Baling Bagging	1.00	@	1.25
Paper Mill Bagging	.55	@	.65
Bagging No. 2	.45	@	.50
No. 1 Burlap	1.75	@	2.00

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	—	@	.01¼
New White No. 1	.05½	@	—
New White No. 2	.04½	@	.05
Silesias No. 1	.03½	@	—
New Black Silesias	.02½	@	.03
New Unbleached	.06	@	—
Fancy	—	@	.02¼
Washable	—	@	.01¾
Cottons—According to grades—			
Blue Overalls	—	@	.03¾
New Black, soft	.04	@	.04½
Khaki Cuttings	.03	@	.03¾
O. D. Khaki	.03	@	.03¾
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	.04	@	.04¾

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.00	@	—
White No. 2			
Repacked	.01½	@	.01¾
Miscellaneous	.01½	@	.01¾
Twos and Blues	1.25	@	1.50
Thirds and Blues			
Repacked	1.10	@	1.25
Miscellaneous	.85	@	.90
Black Stockings	2.25	@	2.50
Roofing Stock			
No. 1	.85	@	.95
No. 2	.65	@	.75
No. 3	.50	@	.55

Foreign Rags
(F. o. b. Boston)

Dark Cottons	.85	@	1.00
New No. White Shirt Cuttings	.04½	@	.05
Dutch Blues	1.50	@	1.75
New Checks & Blues	2.25	@	2.50
Old Fustians	1.15	@	—
Old Linsey Garments	.90	@	1.05

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.09¾	@	—
No. 2 Sulphite	.08	@	—
No. 1 Colored	.10¼	@	—
No. 2 Colored	.08½	@	.10½
Ledgers (sulphite)			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.20	@	—
No. 3 M. F. (Carloads)	5.70	@	—
No. 4 M. F. (carloads)	4.75	@	—
No. 1 S. C. (carloads)	6.65	@	—
No. 3 S. C. (carloads)	6.20	@	—
No. 4 S. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.25	@	—
White Wrap	2.00	@	—
"B" Manila	4.75	@	—
No. 1 Manila	5.25	@	—
Fiber	5.25	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.25	@	—

(F.O.B. Cars Toronto)

News, per ton—			
Rolls (contract)	45.50	@	—
Sheets	50.50	@	—

Pulp
(F. o. b. Mill)

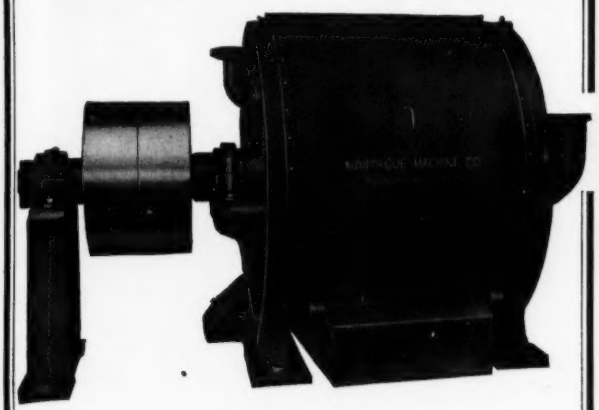
Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	45.00	@	50.00
Sulphate	50.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	1.80	@	—
Soft White	1.40	@	—
White Blk. News	1.25	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	—
Light and Crumpled Book Stock	.80	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut	1.25	@	—
Printed Manilas	.55	@	—
Fancy Shirt Cuttings	.02¼	@	.02½
Kraft	1.25	@	—
News and Scrap—			
Strictly Overissue	.50	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.04¼	@	.04¾



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